

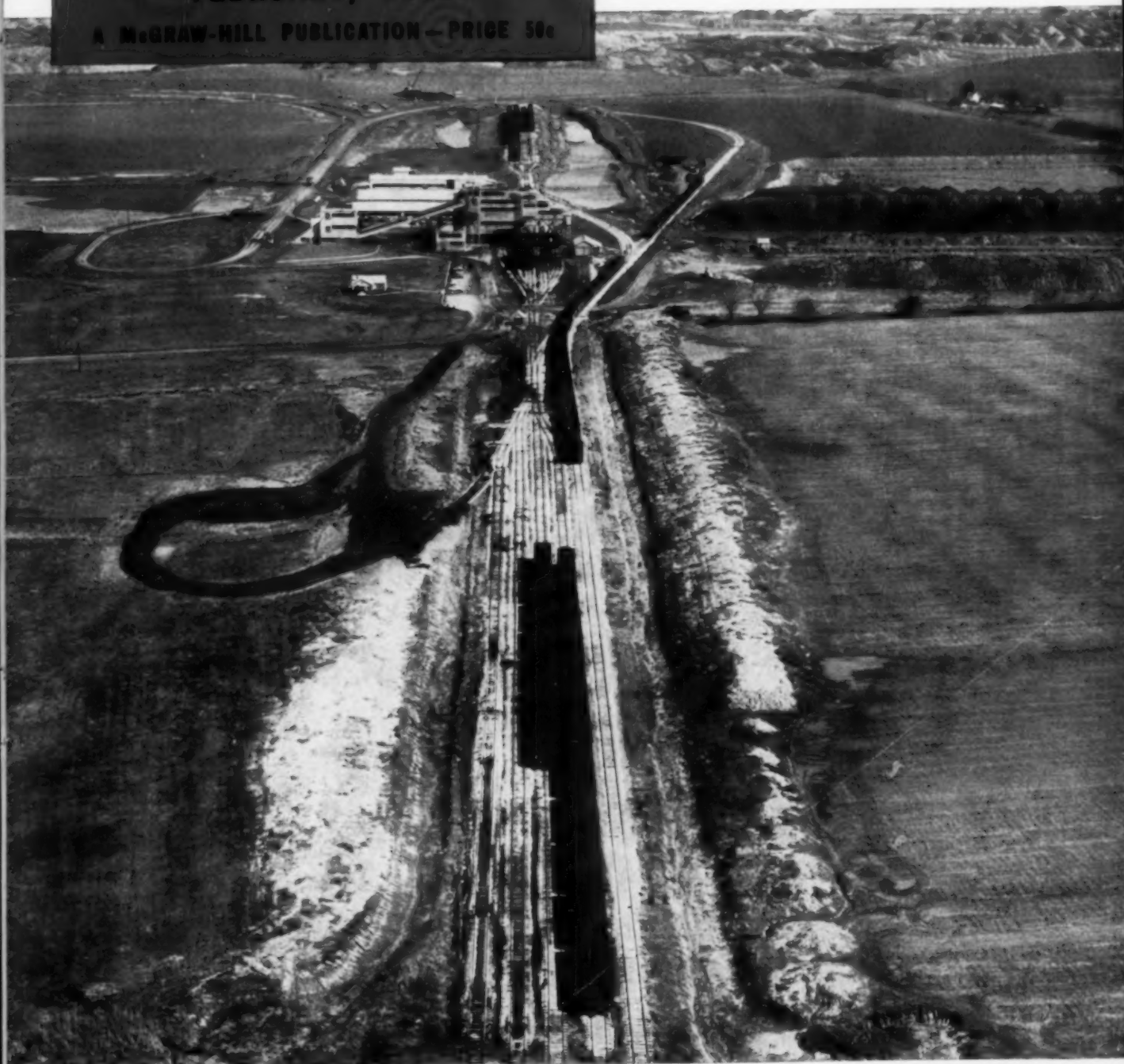
Coal Age

FEBRUARY, 1955

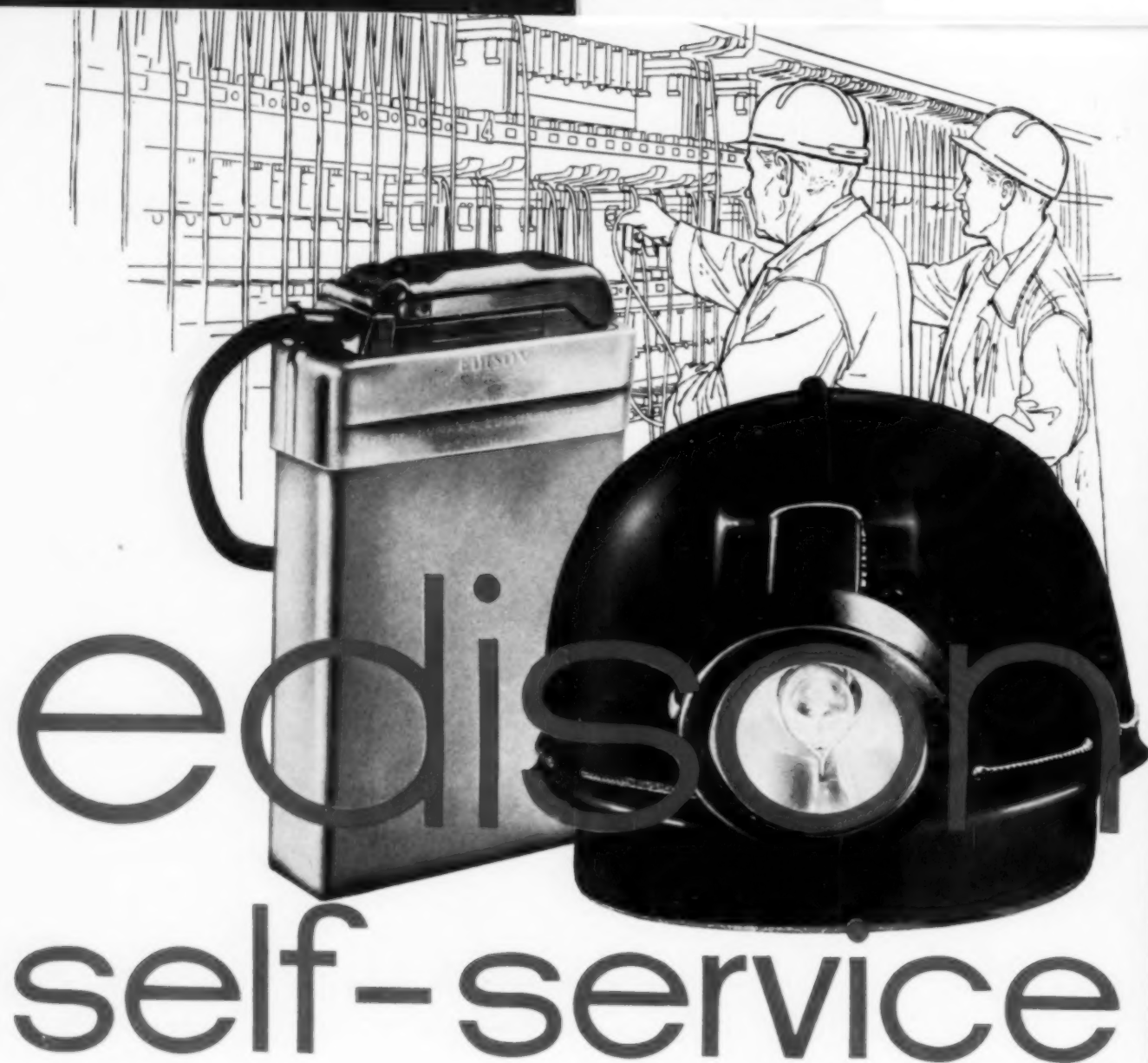
A MCGRAW-HILL PUBLICATION - PRICE 50c

Applying Wet Rock Dust
On Working Shift . . . p 82

How New Maumee Mine
Strips 30-In Seam . . . p 90



1954 AND AHEAD • Mining • Marketing • Safety...pp 53-76



FOR FAST, ECONOMICAL LAMPROOM OPERATION

The miner serves himself! In seconds he has his lamp off the rack, on his belt, and is ready for his shift. And the same holds true when the shift is over. Add it up . . . Edison Self-Service pays off in maximum lamproom economy.

We will be happy to show you how Edison Self-Service can bring economy and efficiency to your lamproom. Write or call for details.



When you have a safety problem, M.S.A. is at your service . . . our job is to help you!

MINE SAFETY APPLIANCES COMPANY

201 North Braddock Avenue, Pittsburgh 8, Pa.

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RESEARCH KEEPS

B.F. Goodrich

FIRST IN RUBBER



Photo courtesy J. Robert Basley, Inc., Pottsville, Pa.

Hose gulps a lake to rescue a coal mine

A typical example of B. F. Goodrich improvement in rubber

BENEATH this lake are coal mines that can be worked again if they can be reached. Drop some pipe in, and pump the 12-billion-gallon lake dry? The water is loaded with acid that eats steel. Use rubber hose? The water is full of silt and stones that tear rubber to shreds.

Ordinary rubber, that is. Luckily, the engineer in charge knew about a special B. F. Goodrich rubber developed for chute linings to stand the grinding of gravel and sand. This rubber is soft enough to *give* under the beating it gets, yet so tough that it's even used in some places to carry broken glass.

B. F. Goodrich hose, lined with this special rubber, has been on this job 18 months and is still good as new. It gulps 14 million gallons of water-acid-mud-small stones a day, yet engineers predict it will last the 3 years needed to finish one of the biggest draining jobs in history.

Reducing costs for business is our business. And the way we do it is by constantly improving all kinds of rubber products to make them last longer, stand harder use.

That's why the original cost of a rubber product doesn't tell the whole

story. It stands to reason that B. F. Goodrich V belts that outlast others 2 and even 3 times, and conveyor belts that often last 10 times longer, will cost you far less over a period of years. To find out about recent money-saving improvements made by B. F. Goodrich and what they can do for you, call your BFG distributor or write *The B. F. Goodrich Company, Department M-371, Akron 18, Ohio.*

B.F. Goodrich
INDUSTRIAL PRODUCTS
DIVISION

YOU GOTTA BE GOOD



You're a crack shot, you're a lightning-like judge of speed and abrupt changes of direction, if you can wing the jet-fast Mourning Dove! He loafs at 45 miles an hour, travels in mile - a - minute bursts, can turn sharply as a flying saucer. He's top target of top sportsmen in every State in the Union.

HULBURT OIL & GREASE COMPANY

PHILADELPHIA, PA.

Specialists in Coal Mine Lubrication

TO GET THIS ONE!

SO DO
LUBRICANTS
AIMING TO
"GET" FRICTION
IN COAL
MINING
MACHINES

THAT'S
WHY SO
MANY
MINES
USE



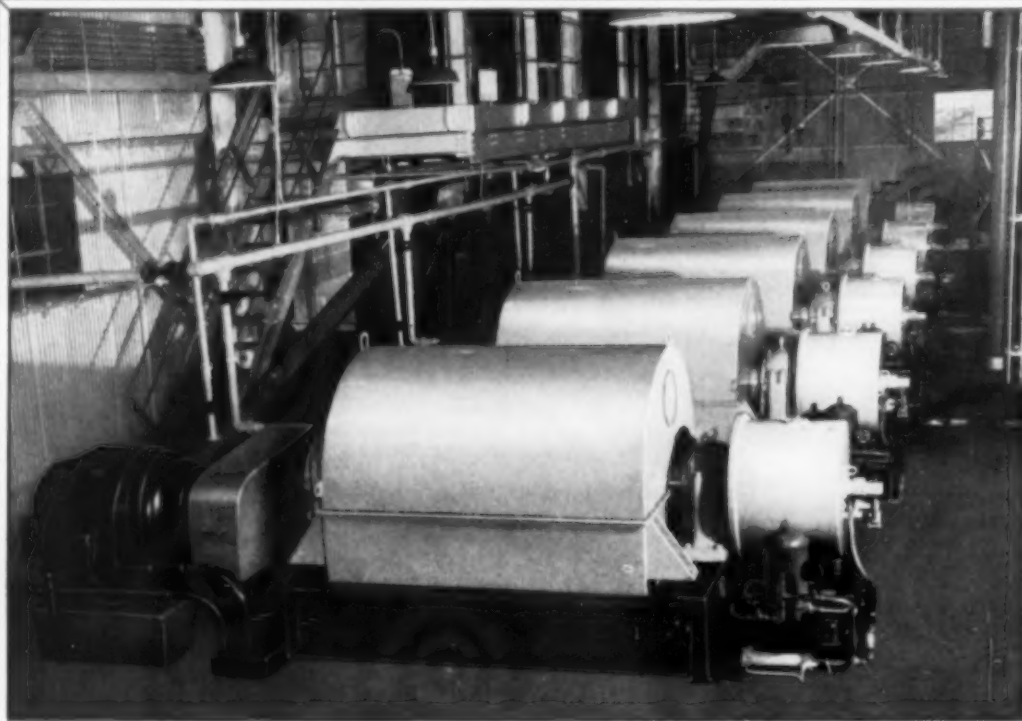
Hulburt

QUALITY LUBRICANTS

When your coal mining machines begin to loaf . . . when they won't accelerate like you want them to . . . don't go into mourning! That's strictly for the birds! Draw a bead on FRICTION with

Hulburt Quality Lubricants. They're top choice of top coal mine operators whose top target is lower operating and maintenance cost through better lubrication.

PICTURE THESE BIRDS IN *Your* PREPARATION PLANT



DEWATERING YOUR $\frac{3}{8}$ " x 0 COAL can be a clean, continuous, super-efficient, low cost operation, when you use Bird Coal Filters to do the job.

The **BIRD** handles big volume — ton of coal per Filter per minute and two to three times the volume of water.

The **BIRD** gets your fine coal dry — down to seven per cent or less with coal containing as much as 10% minus 200 mesh.

The **BIRD** takes out those high ash, high mois-

ture content slimes whenever they are present in the fine coal. A simple rinsing operation does the trick.

The **BIRD** does the complete job, without auxiliary equipment.

The **BIRD** runs non-stop, with maintenance shut-downs scheduled only after months of continuous operation, not days or shifts.

The **BIRD** costs around five cents a ton to operate. Maintenance averages less than two cents a ton.

Ask us to prove that this is the right way to do the job in your preparation plant as it has proved in scores of others.

BIRD MACHINE COMPANY South Walpole, Massachusetts



Coming in Coal Age

"GAS FROM COAL" is the lead-off feature scheduled for March *Coal Age*—a progress report on the production of natural-gas substitutes. Of considerable interest is the urgent need, in the opinion of authorities in the field, of developing capacity and improved methods for making gas from coal to bolster limited future supplies of natural gas. Rightly so, these experts point to coal reserves as the largest source of fuel for future generations.

"Operating Reports" planned for March and later cover various recently developed properties and a number of new ideas in machine use and mining methods. For example, look for:

How an Indiana producer boosted operating efficiency by modernizing its washery and tipples at a location best suited for shipping by rail and truck and opening a new portal to tap more reserves and eliminate haulage problems.

An automatic underground loading point developed by a Kentucky mine that saved labor, while adding to section production and belt life, and reducing motor and starter maintenance by 75%.

American development of two new Greek lignite mines opened to fuel a much needed power plant, including development of mining methods for efficient recovery of a thick, highly inclined lignite bed with poor roof and bottom, and design of a preparation system producing a fuel of maximum quality.

How an Ohio company used an overburden drill to sink an 18-ft shaft 76 ft deep, following it with a clam-shell loading out 10-ft sections—a new wrinkle for faster, cheaper shaft-sinking.

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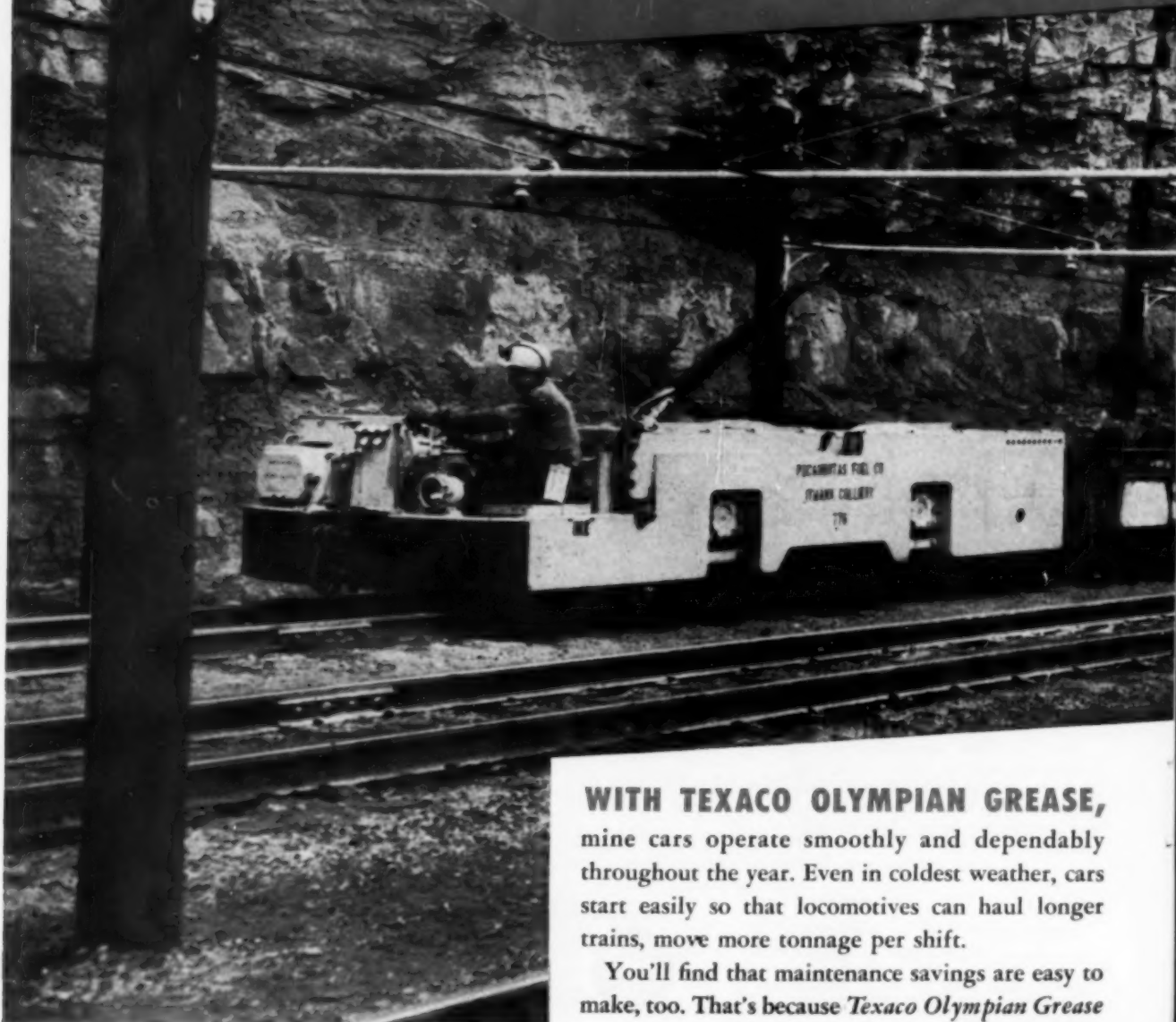
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mine cars operate smoothly and dependably
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start easily so that locomotives can haul longer
trains, move more tonnage per shift.

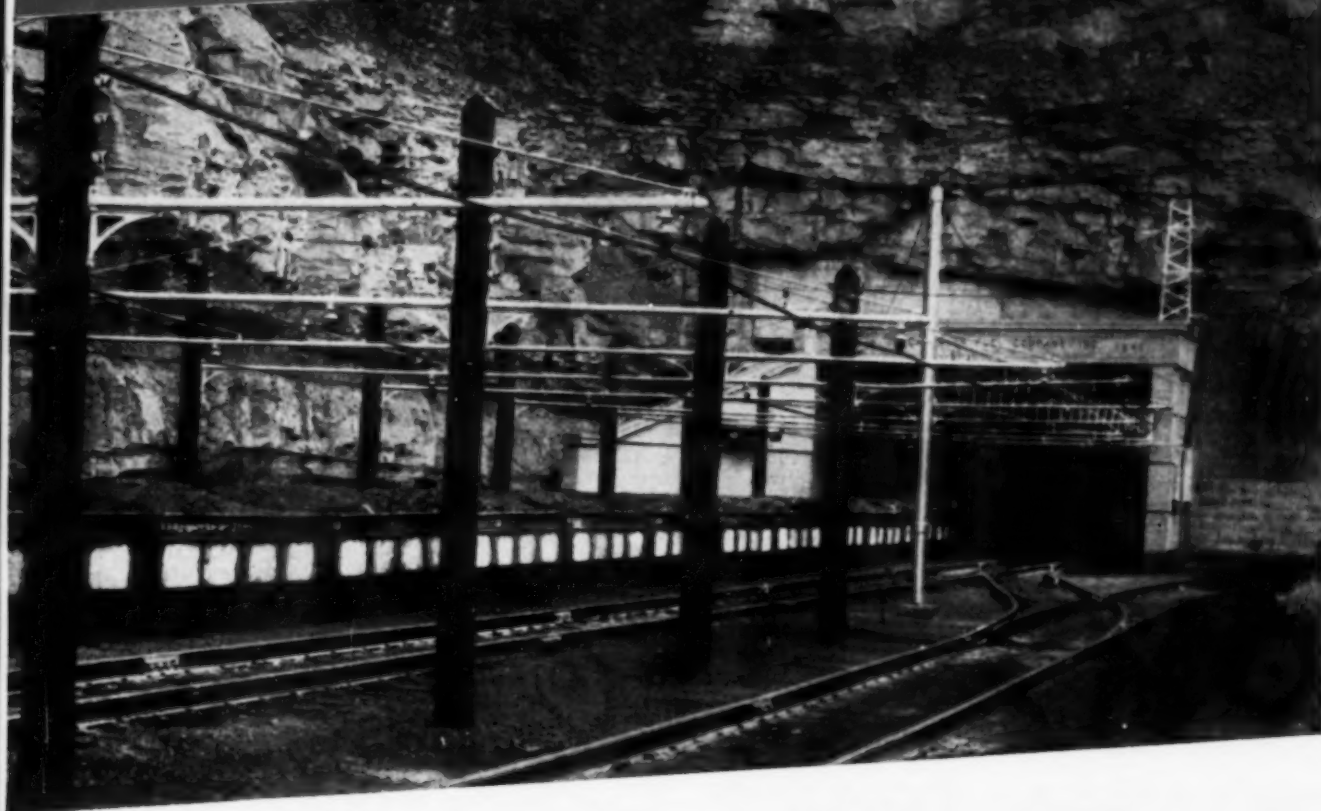
You'll find that maintenance savings are easy to
make, too. That's because *Texaco Olympian Grease*

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DONALD O'CONNOR
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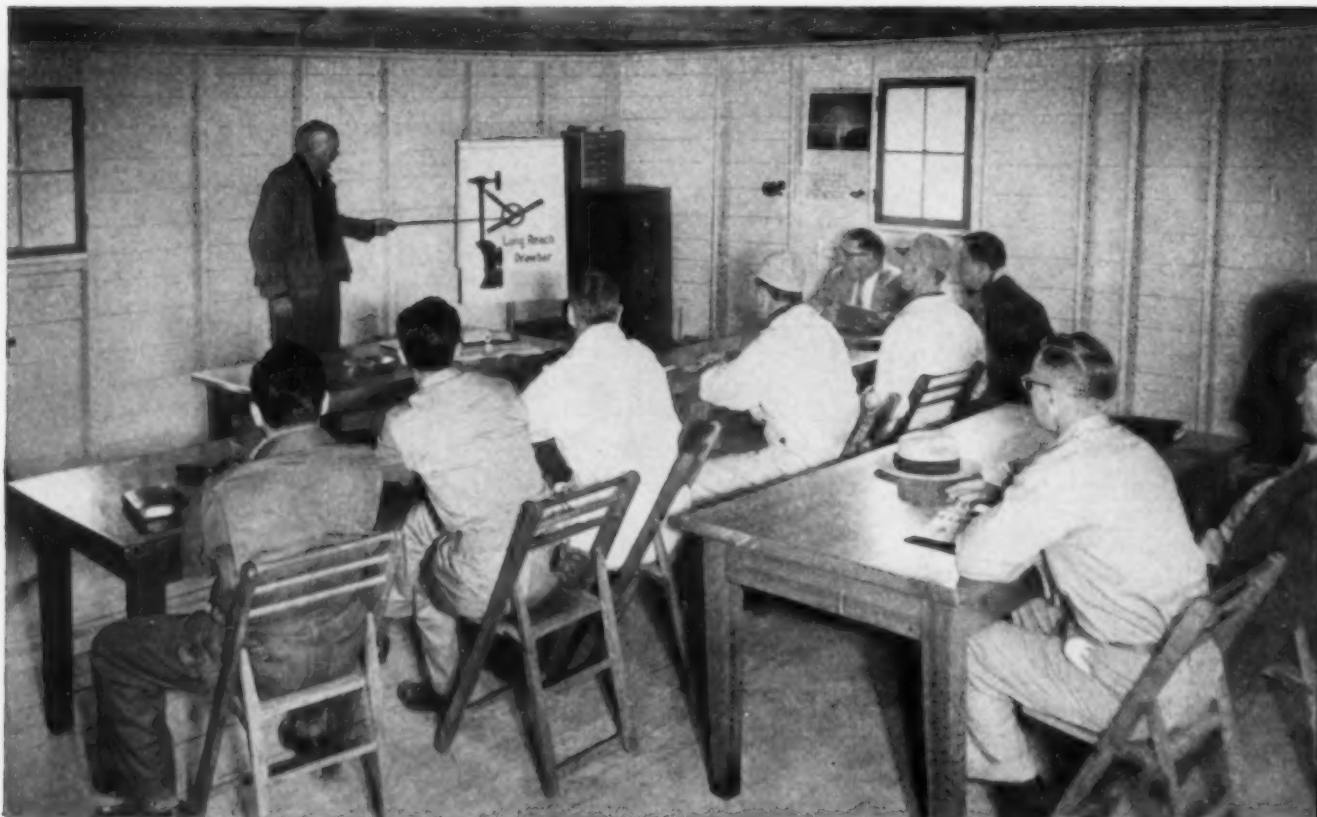
stays in the bearings . . . resists oxidation and separation . . . affords longer lasting protection against dirt and wear. There are three consistencies of *Texaco Olympian Grease* to meet the requirements of plain, cavity hub or anti-friction bearings.

For grease-lubricated ball and roller bearings in electric motors, use premium-quality *Texaco Regal Starfak*. It *stays in* the bearings, retains consistency

under tough operating conditions. You'll enjoy top protection against wear and rust...lower maintenance costs.

Find out how a Texaco Lubrication Engineer can help keep *your* operating costs low, *your* equipment efficiency high. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICANTS for the Coal Mining Industry



PREVENTIVE MAINTENANCE TRAINING KITS — movies, slides, charts and literature are available to help train your personnel. Your Allis-Chalmers dealer will pre-

sent it for you at your convenience, or arrange to have a factory man do the job. And it can be tailored to suit your specific machines and job conditions.

How mine operators can take full advantage of Allis-Chalmers Dealer Service Plan to help protect profits

BENEFITS:

Better performance — more time on the job — longer equipment life — lower maintenance cost — higher resale value

Experience has convinced many mine operators that the Allis-Chalmers Dealer Service Plan is geared to keep equipment operating efficiently. They have found that taking full advantage of such service is easy, and that it pays big dividends. Here's why.

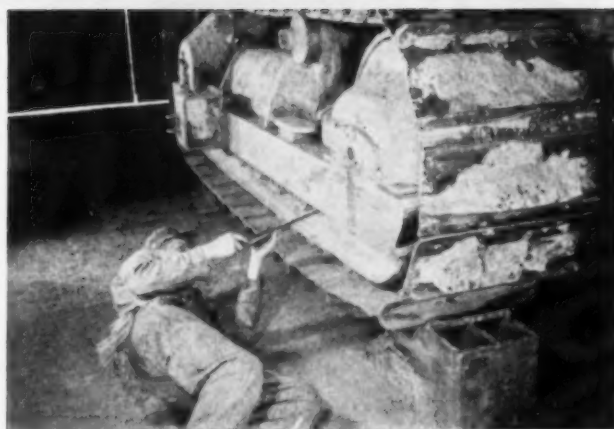
Allis-Chalmers dealers offer them a *planned* approach to service, right from the day their equipment is delivered. It covers everything from service schools to lubrication schedules, and from parts to preventive maintenance.

You owe it to yourself to take a look at the advantages this plan offers. Then see your nearby Allis-Chalmers dealer soon and ask him to give you all the facts.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.



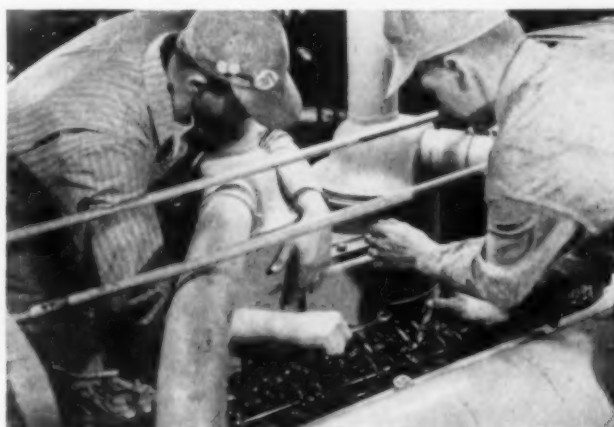
FAST PARTS SERVICE — Factory-built Allis-Chalmers parts are stocked in quantities by the dealer, to give you parts service as close to your job as possible. And remember, experienced equipment men agree it pays to use only standard factory-built parts.



SCHEDULED CHECKUP PROGRAM — Your Allis-Chalmers dealer will help you plan a schedule for all maintenance to keep your equipment operating efficiently. You'll save on repair bills, avoid costly downtime, get far better performance, longer life from your machines.



OPERATING TIPS — Allis-Chalmers dealer servicemen are trained to give your operators all the facts they need to operate your equipment most productively. For example, one of the most important things for an operator to know — how to recognize when adjustments should be made.



SPECIALIZED FACILITIES at your Allis-Chalmers dealer include factory-approved tools and all necessary service equipment. Factory-approved methods are used to save you time and money, assure finest workmanship, to help you get full value for your equipment dollar.



FACILITY-TRAINED DEALER SERVICEMEN have the specialized experience to help you spot trouble symptoms fast, help you prevent costly breakdowns. Their training never stops; they make it a policy to stay abreast of every development so they can be of real value to you. And they're ready to go when and where they're needed.



FACILITY SERVICE SCHOOL TRAINING is open to your servicemen just as it is for dealers. Training is by men who know the equipment best. Visual aids and easily understood literature are used. And your men discover that Allis-Chalmers design simplicity makes the equipment easy to learn... easiest of all to service.



They load them high and move them fast

What you see here is a fine example of up-to-the-minute, economical mine haulage. No spillage, no half-loads; just car after car of piled-high coal, hauled out on smooth, heavy track that will give dependable, efficient service for years. This is another Bethlehem prefabricated haulage system that is steadily repaying its modernization cost.

More and more operators are calling on Bethlehem for help in modernizing haulageways, or planning and building new ones. Bethlehem maintains a staff of engineers whose sole purpose is to design good track and help customers with their haulage problems.

If you call in a Bethlehem technician, you'll like the way he operates; his thorough study of your workings, his way of looking at the problem through your eyes, the efficient way he designs the new layout to meet your local conditions.

His plan will include Bethlehem prefabricated track-

work, which can easily be installed even by green crews. Bethlehem track comes with minimum number of rail lengths; all cutting and curving are done in advance. You're saved the very substantial expense of engineering the job yourself—and you gain a modern track system that can be taken up and reused again and again.

All this is far less costly than you probably suppose. In fact, as hinted above, a Bethlehem modern haulage system should pay for itself in a very short time. A Bethlehem man will be happy to sit down with you to discuss details. You can reach him through our nearest sales office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation. Export
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BETHLEHEM PREFABRICATED TRACK

"Our TD-24s Move Overburden Where Other Crawlers Can't Move"



ROCKY OVERBURDEN, much of it containing boulders as big as or bigger than this one, makes stripping work extremely difficult at the Junior Pocahontas Coal Company operation. Despite tough going, Junior's two TD-24 crawlers have worked a combined total of five years with little downtime.

Cut Through Rock and Shale to Reach Mountainside Seam at West Virginia Stripping Operation

Overburden varying in thickness from less than an inch to 45 feet covers a 5-foot vein of Pocahontas No. 3 on Junior Pocahontas Coal Company's lease near Goodwill, West Virginia.

Most of the overburden, which lies along the side of a mountain, is composed of cap rock, boulders of various sizes, and shale.

Rugged though the job is, Junior's two INTERNATIONAL TD-24 crawlers handle the work with speed, with economy, with very little downtime.

According to Superintendent K. J. Linkous, "I'll take a TD-24 anytime for heavy work. It's the extra power, balance and maneuverability that makes it tops for the tougher stripping jobs."

"A TD-24 can pioneer the mountainsides and move overburden where other crawlers can't move. And you can't beat a TD-24 for ease of

operation and visibility."

The INTERNATIONAL TD-24 passed its latest official test with a rating of 161 maximum drawbar horsepower, unequalled by any other crawler tractor now in production. See how you can step up production on your job. Call your INTERNATIONAL Industrial Power Distributor today. He'll arrange a demonstration of the INTERNATIONAL crawler with matched INTERNATIONAL blade or scraper best for your job; on your job, tomorrow.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



INTERNATIONAL®
INDUSTRIAL POWER

MAKES EVERY LOAD A PAYLOAD



Over-all view of the two belts, reinforced with Du Pont's "Cordura", at the Emerald Mine. Their total length is 4,632 feet, with refuse being carried from coal washer to dumper. Flow makes a 90° turn with a transfer station at the junction of the belts. The belts hug the center idler for better troughing and training throughout their run.

Emerald Coal and Coke Co. reports:

Belts reinforced with Du Pont "Cordura" give topnotch performance under tough conditions

The two conveyor belts in use at the Emerald Mine, Clarksville, Pa., are subject to running conditions that include exposure to all kinds of weather, and the carrying of wet, cold refuse from the coal washer—yet they show no signs of wear after 11 months' trouble-free service.

The belts, reinforced with Du Pont Cordura* High Tenacity Rayon, carry 200 tons of material per hour. Manufactured by The Goodyear Tire & Rubber Co., the belts have caused no delays or shutdowns since their installation. The Emerald Coal and Coke Co., operators of the mine, report

excellent all-round belt performance.

The extra strength of Du Pont "Cordura" permits a belt that's thinner, yet stronger. And the low stretch of "Cordura" reduces expensive downtime for take-up and resplicing.

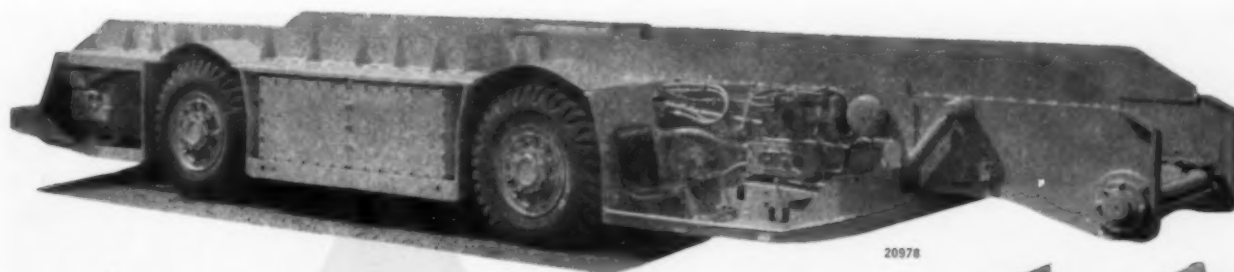
Why not consider "Cordura" before ordering your next conveyor belt? Write us for names of suppliers . . . and send for your free copy of the new booklet "Mine & Quarry Facts About 'Cordura'". Address: Textile Fibers Department, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

* REG. U. S. PAT. OFF.

Du Pont *"Cordura"* High Tenacity Rayon
STRENGTH AT LOW COST

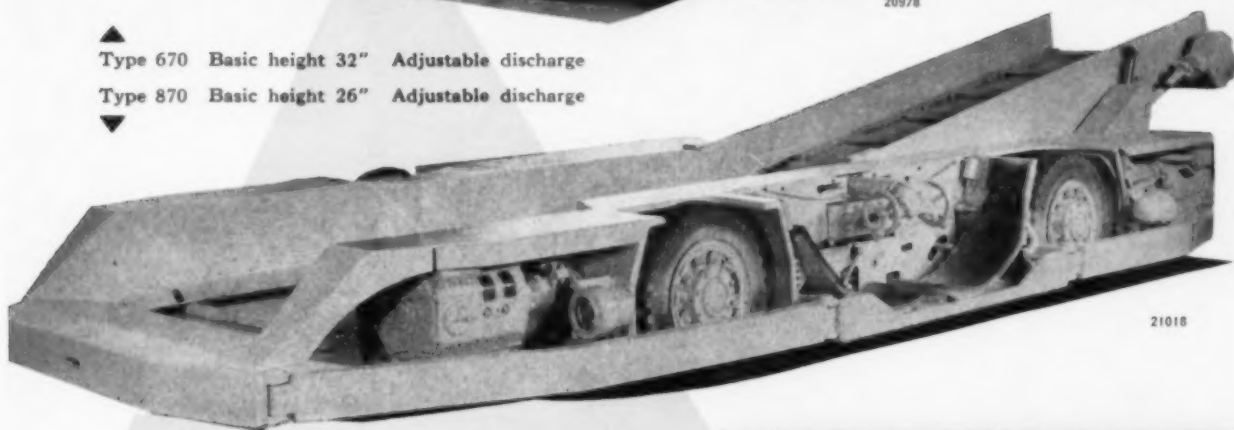


BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



▲ Type 670 Basic height 32" Adjustable discharge

▼ Type 870 Basic height 26" Adjustable discharge



LOW COAL? THERE'S A GOODMAN SHUTTLE CAR TO FIT THE JOB

These cars have all the structural strength expected only in big shuttle cars. Wheel units, gear reducers, electrical control parts, conveyor chain and flights are counterparts of those found in big Goodman cars — some are even interchangeable.

The two traction motors on each car can be either 7½ or 10 hp., the conveyor and hydraulic pump motor is 10 hp. All motors use identical and interchangeable motor shells and armatures. Water level full capacity of the 26" car with 33" discharge end extension is 94 cu. ft.; of the 32" car it is 110 cu. ft. On both cars, capacity is increased with longer end extensions and on the 32" car it can be increased still further with the addition of sideboards. Both cars offer such standard Goodman features as 4-wheel drive, 4-wheel power steering, 4-wheel brakes, hydraulic controlled cable reel, one- or two-speed conveyor chains, dual control in operator's cab, U.S. Bureau of Mines approval.

These cars are fully described in Catalog No. 5411. Let us send you a copy.

Other cable reel cars in the complete Goodman line:

Type 580, basic height 42", adjustable discharge

Type 582, basic height 42", fixed discharge

Type 570, basic height 48", adjustable discharge

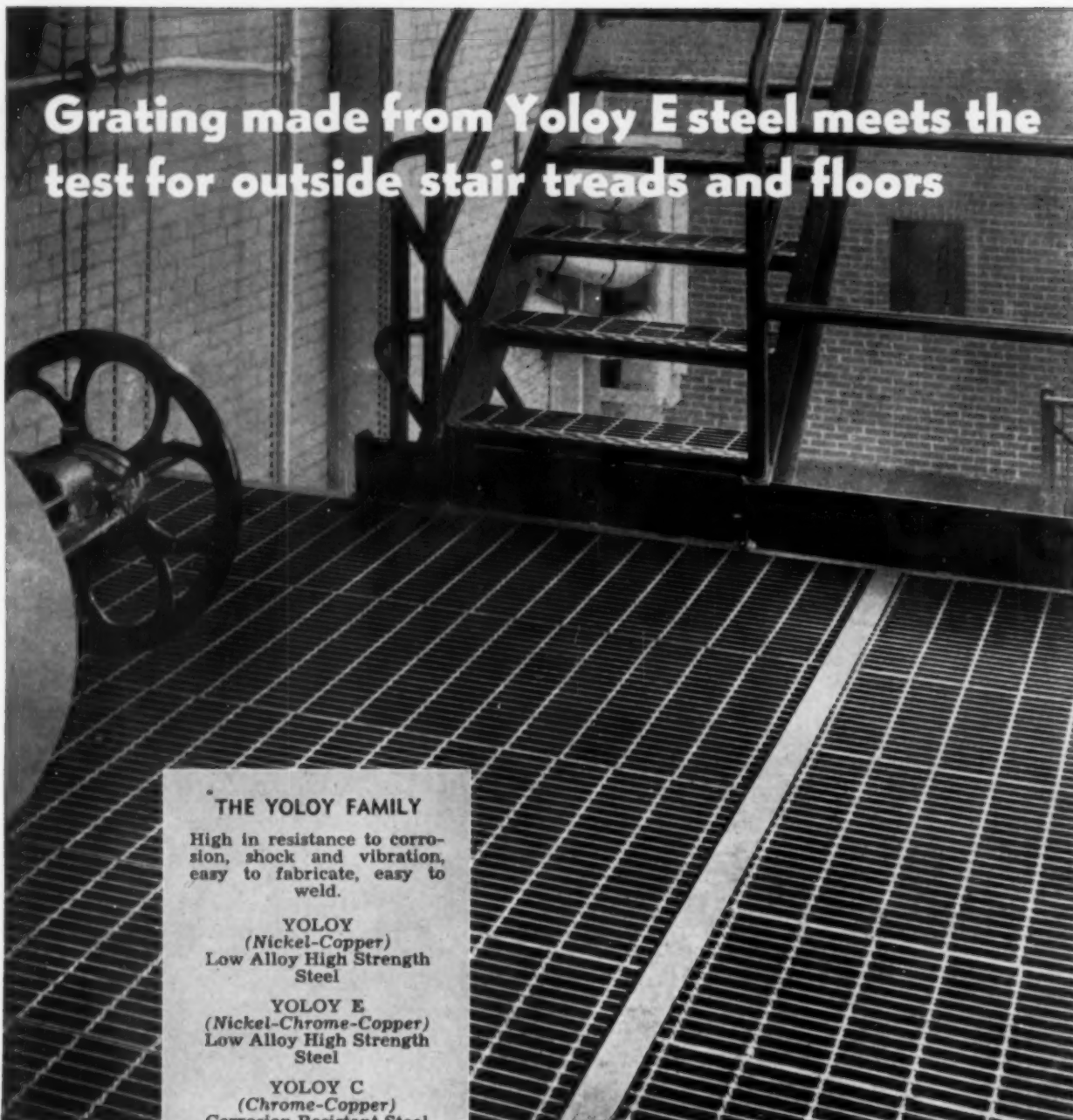
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Grating made from Yолоy E steel meets the test for outside stair treads and floors



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High in resistance to corrosion, shock and vibration, easy to fabricate, easy to weld.

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Low Alloy High Strength Steel

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(Chrome-Copper)
Corrosion Resistant Steel

Photo courtesy Blaw-Knox Company.

Youngstown



● Safety - durability - atmospheric corrosion resistance - good appearance - all are inherent in this grating fabricated from Yолоy E high-strength steel. The design of such grating contributes toward a non skid surface. The Yолоy family of steels includes several types. For details, write our nearest District Sales Office.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

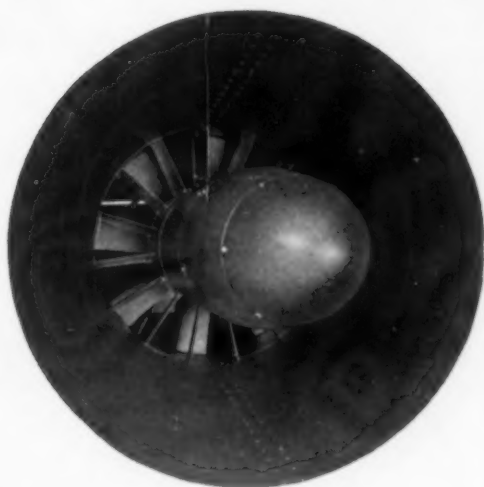
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AERODYNE power for deep breathing underground



Inside view (circle) of big AERODYNE "iron lung" shows scientifically-designed torpedo discharge cowling for reducing air turbulence, sharply increasing fan efficiency.

8H60 AERODYNE installation (top view) at Johnstown Coal and Coke Co. Crichton No. 4 Mine, Nettie, W. Va.

Coal mines can take deep breaths with the Jeffrey 8H Series AERODYNE Fan. From 20,000 to 500,000 C.F.M. of air can be blown or exhausted at pressure up to 20" W.G.

Individually adjustable blades enable the 8H to operate over a large range of capacities at peak efficiency. Fan can be readjusted as mine characteristics change or easily disassembled for transportation to another location.

Hundreds of AERODYNES have been installed since the fan was introduced in 1936. It is easily the most popular mine fan in America, because it is both flexible and reliable.

Jeffrey's Fan line also includes:

6F SERIES AERODYNE—a six-blade fan combining economy and efficiency for light or medium-duty ventilation up to 5" W.G.

12A SERIES AERODYNE—a 12-blade, self-contained deluxe fan for heavy duty . . . designed for maximum pressure of 13" W.G. and volumes from 20,000 to 700,000 C.F.M.

AERODYNE JR.—a low-cost fan for general or auxiliary mine ventilation or industrial applications . . . 5,000 to 150,000 C.F.M. up to 4" W.G.

AERODYNE MIDGET BLOWERS, Type 61 Blowers and Universal Blowers for secondary fan duty.

Write for Jeffrey Mine Fan Catalog 797.



THE JEFFREY

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MANUFACTURING CO.

Columbus 16, Ohio

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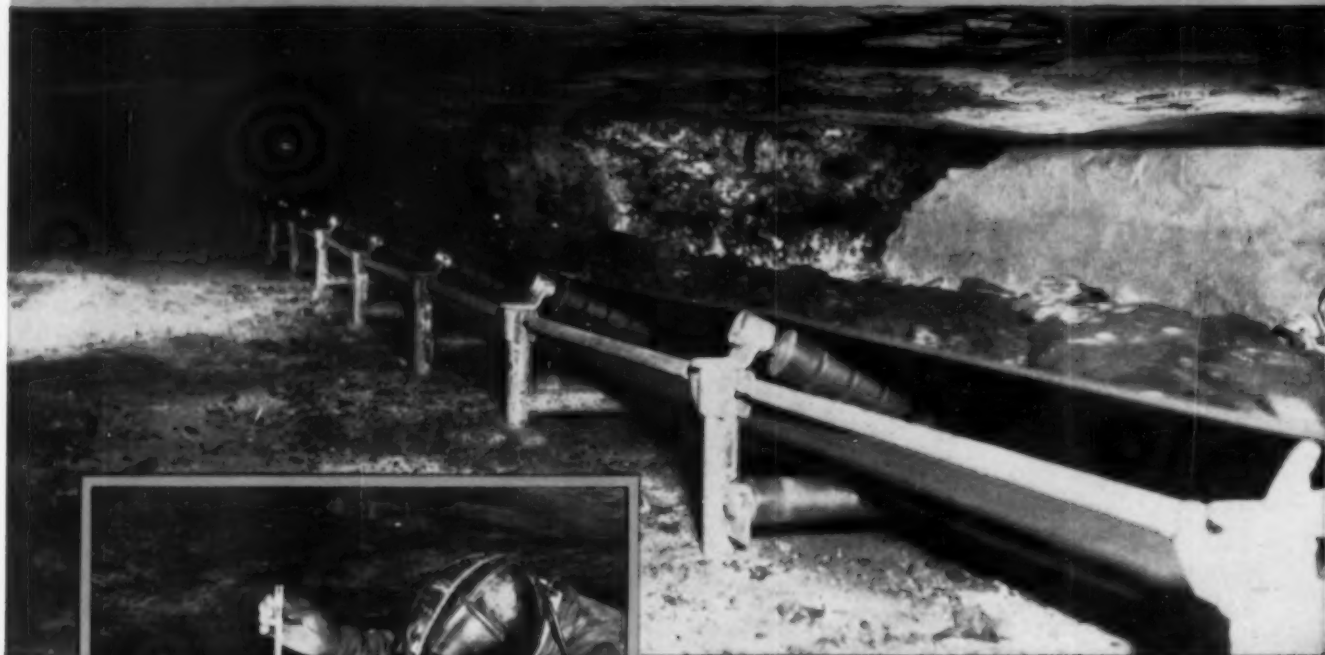
**IF IT'S MINED, PROCESSED OR MOVED
... IT'S A JOB FOR JEFFREY!**

No other **BELT IDLER**

the **JOY LIMBEROLLER**

(PAT. APPLIED FOR)

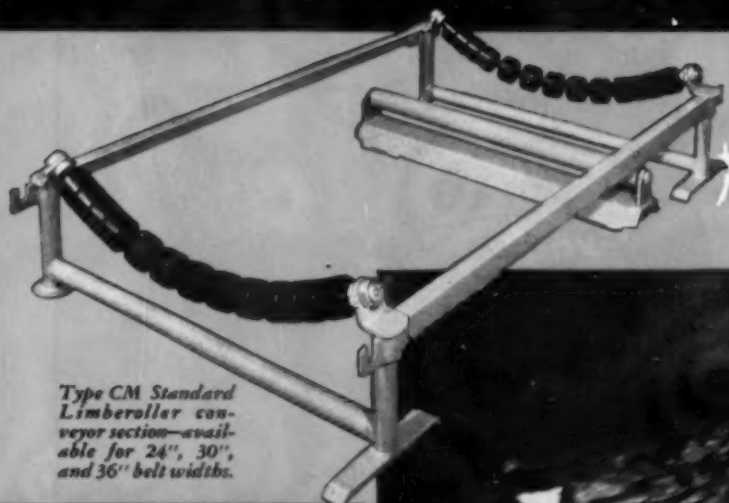
has everything you want for coal haulage



UNDERGROUND . . . the Joy Limberoller weighs 2/3 less than a steel idler. Neither the CM (standard) or CL (low) stands require bolts or cover sheets; there are fewer parts and less weight to handle than with any other conveyor.

IN LOW COAL . . . CM section, 13" high, shown in 32" seam, and CL section (stainless steel skid return idler) 10" high, provide lower conveyor systems than any other available. Now you can have the efficiency of belt haulage in tight locations where it was never before possible.

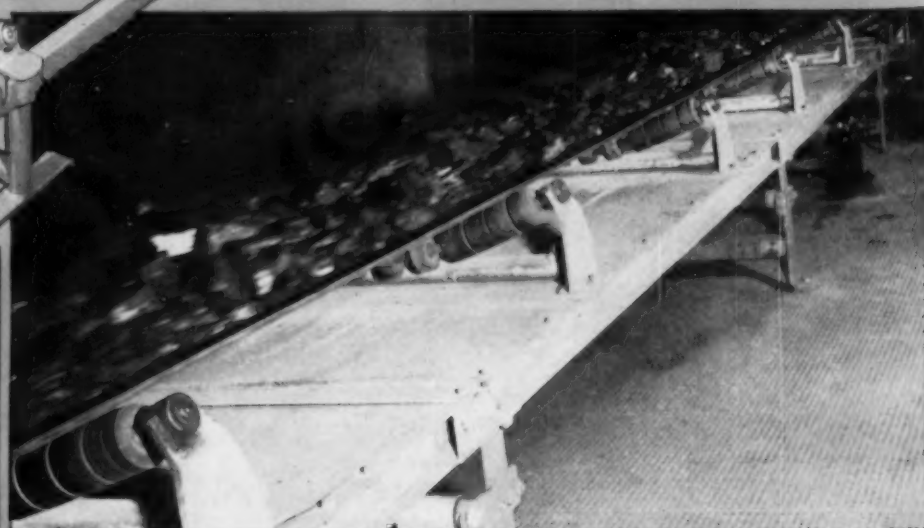
even comes close!



Type CM Standard Limberoller conveyor section—available for 24", 30", and 36" belt widths.

LIMBEROLLER

THE IDLER WITH FLEX APPEAL



ABOVE GROUND . . . Limberoller idlers can be used anywhere around the mine. Above, in use in the tippie, mounted on type HM stands which have brackets for bolting to conventional conveyor sections.



The Limberoller consists of a series of pressure-molded neoprene discs, molded to a neoprene-sheathed, flexible steel cable. The cable is freely suspended from two cadmium-plated, precision-type, double-row ball bearings. Bearings are supported above and to each side of the belt, out of the dirt zone. They simply drop in place and are locked with spring clips—can be changed or new stands added while belt is loaded and moving.



Write for
Bulletin LD-103, or

*Consult a
Joy
Engineer*

JOY

WORLD'S LARGEST MANUFACTURER OF
UNDERGROUND MINING EQUIPMENT

**Of Vital Interest
to
Preparation
and
Processing
Men**



This new 20 page Heyl and Patterson Booklet is crammed with information on the H & P Cyclone. It shows how the H & P Cyclones operate, provides flow diagrams and photographs from actual installations,

and gives operating data from typical applications in the coal, mining and chemical processing industries.

There are probably places in your plant where H & P Cyclones could be used to advantage to replace or supplement other more costly equipment. The obvious benefits of high efficiency, low cost and small amount of space used may open fields of application in which the Cyclone has never been tested.

The very nature of the H & P Cyclone makes it something that every processing man should know about. You will find this booklet worthy of your deep study. It belongs in your permanent file for future reference. Write today for Booklet CT-954.

If you feel that you have a possible Cyclone application, contact the H & P Research Department. If our experienced engineers don't know the answers to your problem immediately, they have complete facilities and data to obtain these answers. You can be assured of their complete cooperation.

Cyclone Thickeners
Thermal Dryers
(The Drying Dutchman
(Reineveld Centrifugal Dryer)
Thorsten Coal
Sampling Systems
Rotary Mine Car Dumpers
Coal Crushers
Coal Preparation Plants
Bradford Breakers

Heyl + Patterson, Inc.
"SINCE 1887"

55 FORT PITT BLVD. PITTSBURGH 22, PA.



Hydraulically operated equipment on McCarthy Drills includes: jacks for levelling auger drill, auger guide, auger hoist, moving jacks and skids, and auger feed.

Auger-Mine BONUS Coal with

McCarthy Coal Recovery Drill, Model 1436-42, with 12' augers as used by Excavators, Inc., Sommerville, W. Va.

- ★ RECOVERS BEST QUALITY COAL AT LOWEST COST
- ★ 40 TONS AN HOUR WITH 36" DIA. AUGER
- ★ COMPLETELY HYDRAULIC
- ★ SELF-PROPELLED FROM HOLE TO HOLE
- ★ CHOICE OF AUGER DIAMETERS 24", 30", 36", 42", 48"

THE SALEM TOOL CO.

763 S. ELLSWORTH AVE.

SALEM, OHIO, U.S.A.



TIREX... Friend of Welders and Replacement Costs

Whether welding is easy and economical depends, to a large degree, upon the cable. If the cable is very flexible, it won't tire the operator by dragging on his wrist. If it can stand hard usage without failing, replacement costs are reduced.

The nearer welding cable is like limp rope in pliability, the easier it is to work with. Simplex-TIREX Welding Cable pliability depends upon making the conductors of many hairfine copper wires closely stranded together. A paper tape between conductors and jacket for easy stripping does not hamper flexibility.

The most wear-resistant welding cable jackets are made with properly-compounded neoprene and cured in lead. Neoprene resists acids, alkalies, abrasion, flame, oil, sunlight, and water. Curing in lead produces a dense, tough jacket. Simplex-TIREX Welding Cables are made with Selenium Neoprene Armor and cured in lead.



Simplex

TIREX

CORDS AND CABLES are made only by the

SIMPLEX WIRE & CABLE CO., 79 Sidney St., Cambridge 39, Mass.

Although welding cable sizes generally used range from No. 2 A.W.G. to No. 3/0 A.W.G., Simplex-TIREX Welding Cables are made in sizes No. 8 A.W.G. to 1,000,000 Circular Mils. Catalog No. 1011 has complete details. Write for it.



Over 2 yards of clay in the bucket of this 1-yard MICHIGAN, owned by Leonard Elam, Gardner, Illinois

Get a Bonus in Every Bucket!

— with a **MICHIGAN**

Notice two facts about this operation:

1 More than 2 yards in that 1 yard capacity bucket—a 100% bonus load!

The independent bucket control on MICHIGAN tractor shovels makes this kind of performance possible. Two powerful double-acting cylinders on the MICHIGAN bucket provide tremendous break-out power, enable the operator to "work" the bucket while it's buried deep in the pile. His bucket-control lever *over-rides* the boom-hoist, so he doesn't have to lift the bucket out of the pile until he's got a heaping bonus-load.

2 All wheels solidly on the ground!

Here's proof of the MICHIGAN'S bonus margin of weight distribution. These are the heaviest, most powerful tractor shovels on the market today. Even with a 100% bonus bucket load, you still have complete stability and traction.

One brief demonstration will convince you quickly that you'll get a Bonus Bucket every time with a MICHIGAN Tractor Shovel—for more yardage moved, in fastest time, at lowest cost. Such a test is easy to arrange—simply call your nearby MICHIGAN distributor; or use the coupon. MICHIGAN Tractor Shovels are available under the Clark leasing Plan—we'll be glad to send you details.

**CLARK
EQUIPMENT**

CLARK EQUIPMENT COMPANY
Construction Machinery Division
482 Second Street
Benton Harbor, Michigan

23

What's this about demonstrating the MICHIGAN Tractor Shovel?

Also, send us ☐ Specifications . . . and ☐ Lease Plan data sheet

Name _____

Firm _____

Title _____

Address _____

City _____

County _____

State _____

The Facts Behind Allis-Chalmers Leadership in Torque Converter Tractors

*Fourteen years of experience . . . eight years with production models
 . . . thousands of torque converter tractors out in the field . . .
 millions of operating hours on every kind of work.*

TODAY'S tractor owners have given their "stamp of approval" to torque converter drive—as a key factor in the new standards of tractor performance they need for today's closely-bid jobs. Here's why —

Automatic Matching of speed and pull to load and terrain conditions . . . more dirt moved every hour, day in and day out.

Hydraulically cushioned protection for engine, clutch, transmission, rear end. The entire tractor lasts longer! That means less downtime, lower maintenance costs, more profit.

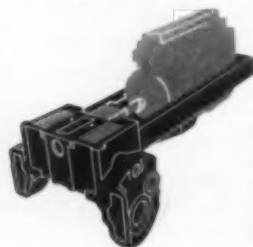
Operators love it! Allis-Chalmers torque converter tractors are so easy to handle (most shifting is eliminated) that operators do a top-notch job all day long.

Yes, the industry's most experienced men are demanding and buying torque converter tractors . . . and in this, Allis-Chalmers leads the way.

But, remember, you don't buy just one feature . . . you buy a tractor, with torque converter drive designed as a matched part of the entire machine. This advanced drive is only one of the many outstanding features that have switched so many leading contractors to Allis-Chalmers tractors. So . . .

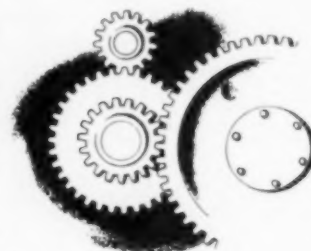
Check all these features before you buy!

All-Steel Box-A Main Frame with one-piece, rear-end housing gives improved weight distribution, soaks up shocks, provides better equipment mounting, greater servicing ease . . . longer equipment life.



Service Simplicity of Unit Construction — Power drive components can be easily removed, repaired or replaced without disturbing adjacent parts . . . saving time and money.

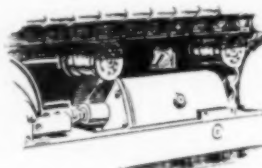
"Live" Sprocket Shafts — "Live" shafts with straddle-mounted bearings permit small, more serviceable seals. Double reduction final drives with smaller gears and shorter, heavier shafts mean extra ground clearance, better alignment, longer life.



1,000-Hour Lubrication — Tapered roller bearings and positive seals on truck wheels, idlers, support rollers and final drives extend lubrication intervals, cut downtime.

Hydraulic Booster Steering — Gives operator small tractor maneuverability with new ease. In addition, self-energizing brakes which take hold with a firm, uniform grip, provide exact control and sure safety with less pedal pressure.

True-Dimension Track provides maximum ground contact . . . plus the right design, the best steels for every job condition . . . heat-treated for long life with the industry's newest, most complete facilities.



Oil-Enclosed Track Release Mechanism — Operates in oil, seals out dirt and moisture, always in working condition to provide positive protection.

See your nearby Allis-Chalmers dealer now for the full story. Whether you're interested in a big tractor like the HD-20 or HD-15 . . . or the smaller HD-9 and HD-5, you can be sure of getting the most advanced tractor in the business, because Allis-Chalmers is the leadership line.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



**ENGINEERING
REPORTS:**

EASY-TO-EXPAND electrical systems are key feature of modern preparation plants which utilize G-E Engineering Services.

How G-E engineering services save time and money at coal preparation plants

Whether you are planning to modernize, expand, or build a new coal preparation plant, General Electric's complete range of engineering services will help save you time and money.

Working with you and/or your consulting engineers, these services will help:

- **DESIGN** an up-to-date electrical system to meet your individual requirements. G-E Application Engineers utilize latest electrical concepts to give you an easy-to-expand system.
- **DEVELOP** new products for your special applications. G-E Product Engineers utilize vast research and developmental facilities to create new products to meet your particular needs.
- **CUT INSTALLATION TIME.** Experienced G-E Field

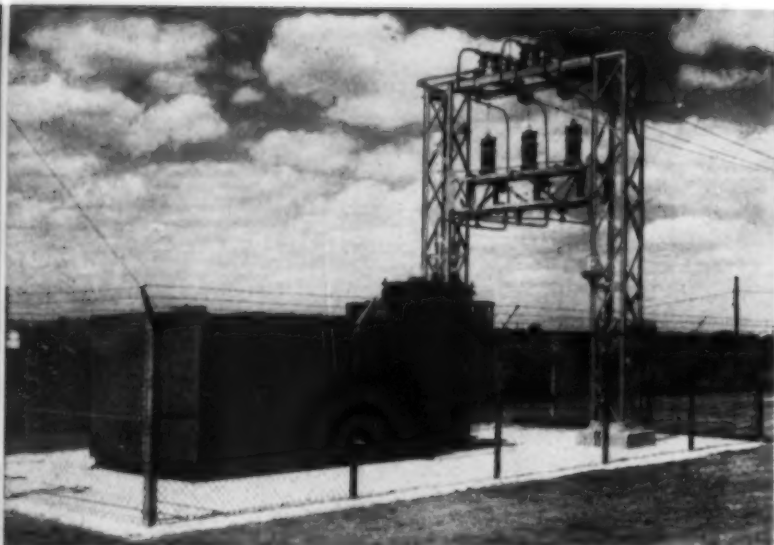
Engineers will help at the installation and start up of your electrical system.

- **CO-ORDINATE** the selection, delivery, and installation of your electrical system. G-E Project Coordination helps eliminate time-consuming paper work by handling these three important functions for you.

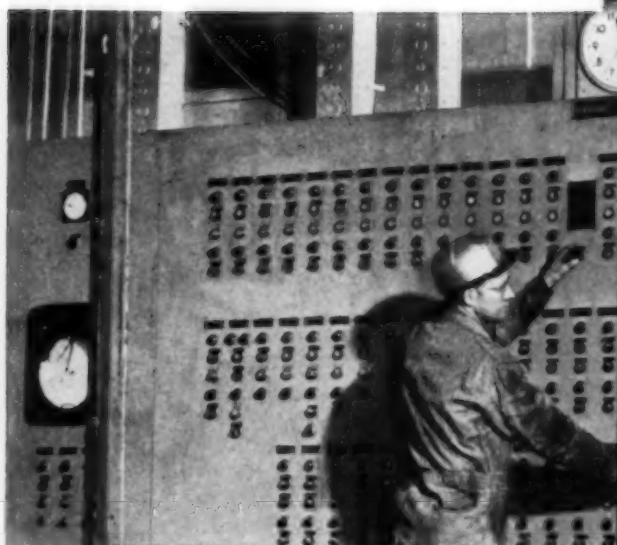
Take advantage of these G-E Engineering Services early in your planning stages. Your G-E Apparatus Sales Representative will put them to work for you. Contact him at your nearest Apparatus Sales Office. General Electric Co., Schenectady 5, N. Y. 663-43

CUT YOUR OPERATING COSTS ►

GENERAL  ELECTRIC



RELIABLE source of power is available with G-E master unit substations. Units are factory-assembled to save installation time.



PUSH-BUTTON OPERATION of plant is available with G-E master control boards. They are designed to control vari-

G-E electrical systems help . . .

LOWER YOUR

To meet today's market conditions the Coal Industry is seeking new ways to cut operating costs in preparation plants. One sure way to help lower operating costs is to install a G-E electrical system. **Here's why:**

AUTOMATIC G-E CONTROLS help eliminate unnecessary manual operations. General Electric's modern electrical systems incorporate these controls wherever possible.

LOW MAINTENANCE is an outstanding feature of General Electric electrical systems. Newly-devel-

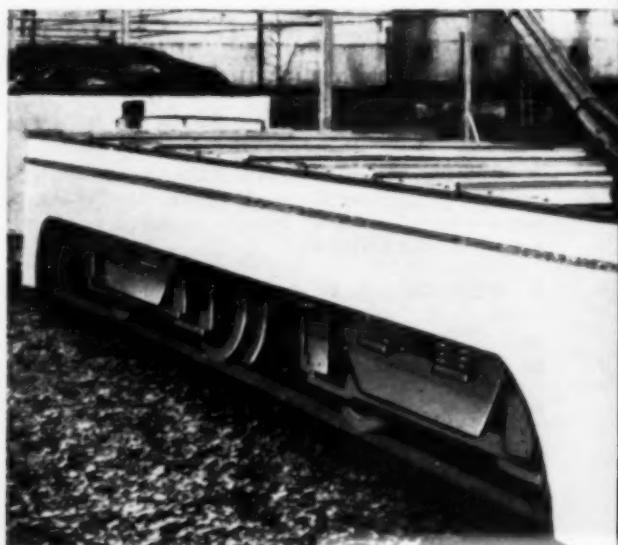
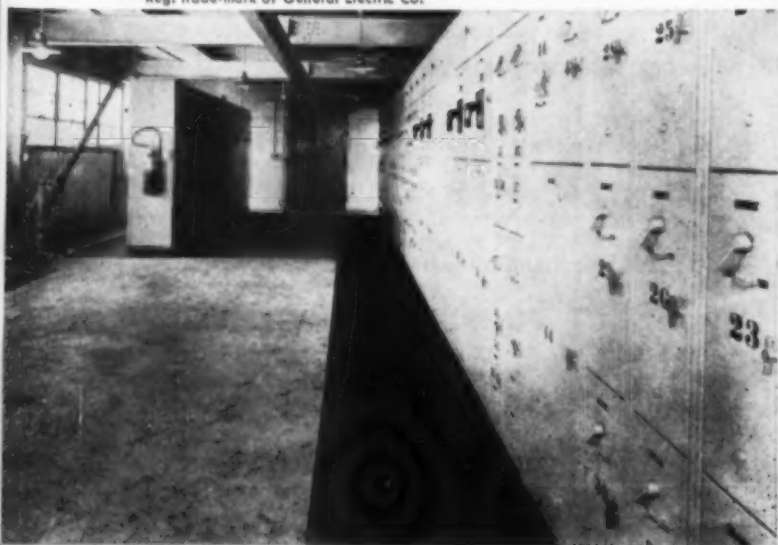
Engineered Electrical Systems for Coal Preparation Plants

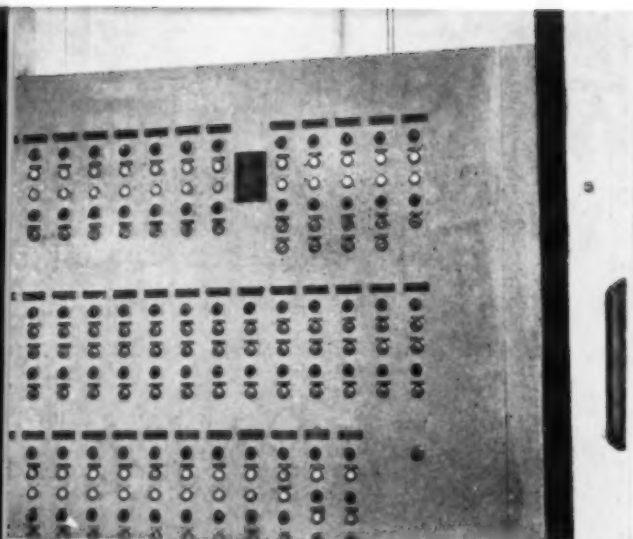


FACTORY-ASSEMBLED G-E unit substations help assure efficient transmission of power to load areas. Addition of G-E capacitors to substations increases capacity and cuts power costs.

COMPACT G-E Cabinetrol® equipment provides centralized control for motors. Custom-engineered, they are easy to expand.
*Reg. trade-mark of General Electric Co.

LOW MAINTENANCE is outstanding characteristic of G-E mine-haulage locomotives. They will help haul more tons





ous cleaning operations from one central location, and give visual indication all units are running.

OPERATING COSTS

oped electric equipment designed for less maintenance is utilized throughout.

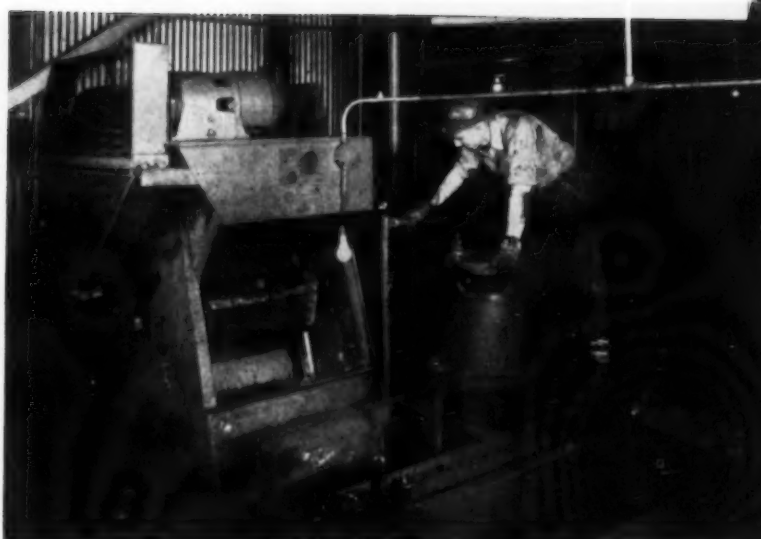
EASY TO EXPAND with market conditions is a General Electric electrical system. Its flexible design makes the installation of additional equipment easy and practical.

To learn more about General Electric's modern electrical systems for coal preparation plants contact your nearest G-E Apparatus Sales Representative. General Electric Company, Schenectady 5, New York.

603-43

GENERAL  **ELECTRIC**

per day to prep plant. Easy-to-operate controls are grouped for the convenience of the operator.



RUGGED G-E Tri-Clad* gear-motors are packaged, single units. They use little more room than a standard motor, freeing more floor space.

*Reg. trade-mark of General Electric Co.



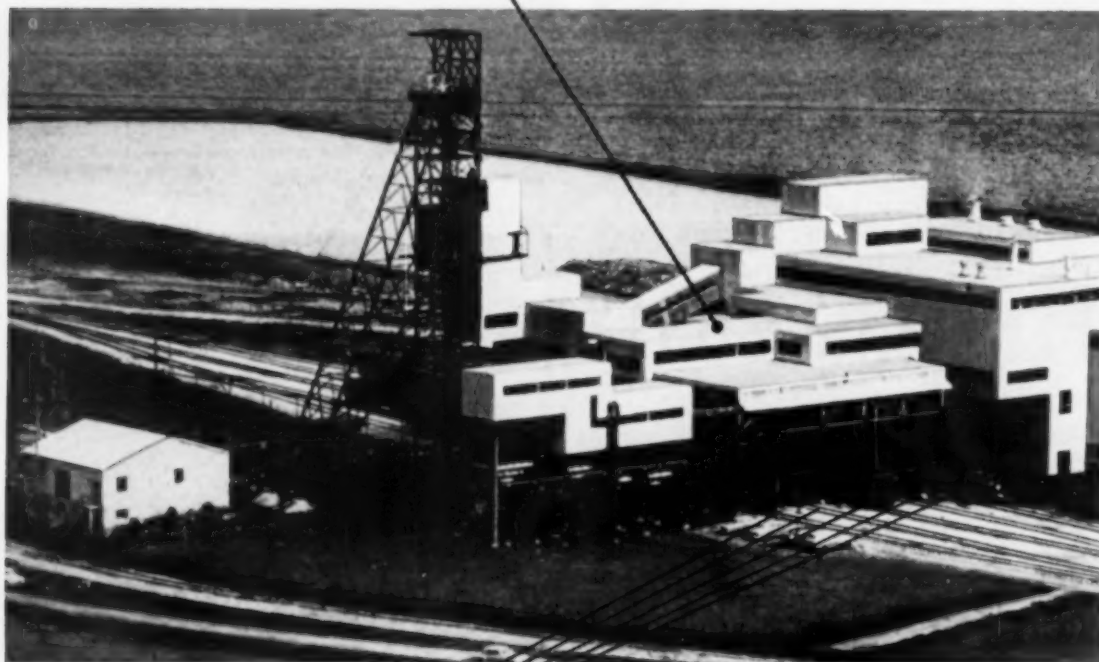
COMPLETE LINE of G-E Tri-Clad motors for coal preparation plants are designed for a minimum of maintenance. Totally-enclosed fan cooled construction helps protect motors against dust.

EXPERIENCED G-E ENGINEERS are ready to help design, co-ordinate and install an up-to-date electrical system for your plant.



Layer Loading is your answer

... to more uniformity and
better blending of materials

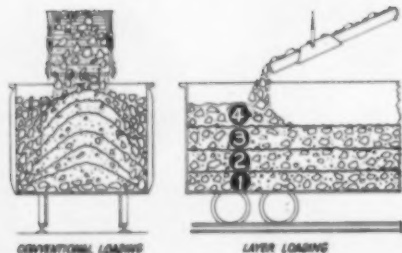


WITH THE PUSH-BUTTON CONTROLLED "BROWNIE" Hoist-Retarder you handle movement of cars in both directions for layer-loading.

One or several cars may be shuttled under the loading point and material loaded in layers with "BROWNIE" Hoist-Retarders. Separation of lumps and fines is reduced. There is less degradation and materials having varying chemical and physical properties may be mixed, insuring greater uniformity of product.

The "BROWNIE" Hoist-Retarder Model HKG has a 15 HP motor and is rated 12,000 lbs. rope pull at a hauling speed of 50 fpm. It can handle three 70-ton cars on a 2% grade. The model HKI is used to distribute materials in five to seven cars. It is driven by a 30 HP motor rated 24,000 lbs. rope pull hauling and 18,000 lbs. lowering at 45 fpm. A smaller model with a 7½ HP motor is also available. Ask us for more information.

Brown-Fayro Division of SANFORD-DAY IRON WORKS, INC., P. O. Box 1511. . . . Telephone 3-4191, Knoxville, Tenn.



BROWN-FAYRO DIVISION OF
SANFORD-DAY IRON WORKS
KNOXVILLE TENNESSEE

ANNOUNCING THE NEW BUCYRUS-ERIE

A
Rotary Drill
for
6³/₄ to 9-inch
Holes

40-R

Here's big news for quarry and mine operators — Bucyrus-Erie has added another model to its line of rotary blast hole drills. It's the 40-R — designed for drilling 6³/₄ to 9-inch holes.

Like the bigger 50-R, this new drill features the flexibility of Ward Leonard variable-voltage control — an outstanding electrical control that gives the operator smooth instant command over rotation speed of drill pipe at all times. In addition, you have your choice of either electric or diesel-electric power *plus* these other outstanding field-proved advantages.

- ① Hydraulically powered down pressure on the bit for maximum controlled penetration.
- ② You can drill continuously for 27³/₄ feet before an additional drill pipe section is added.
- ③ Motor-controlled drill pipe rack holds four sections of pipe, any one of which can be moved into position over the hole and screwed tight mechanically without operator leaving control station.
- ④ Compressed air is used as a bit coolant and as a cutting remover. Fine cuttings are picked up and handled by a Roto-Clone precipitator; heavies pile up adjacent to the drill hole for use as stemming material.

Complete information is yours for the asking. Just fill in the coupon and mail it today.

**BUCYRUS
ERIE**

SOUTH MILWAUKEE, WISCONSIN

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

Gentlemen: I'd like more information on your new 40-R.

☐ Send a bulletin

☐ Or better yet, have your salesman call and tell me.

NAME _____

TITLE _____

COMPANY _____

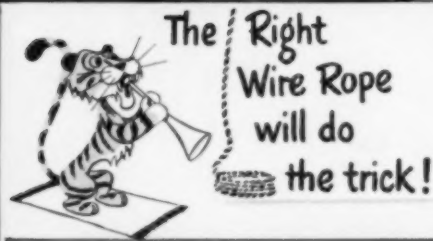
ADDRESS _____

CITY _____ ZONE _____ STATE _____



IT GULPS DIRT BY THE CARLOAD. The Green Hornet—a 50-cu. yd. electric coal stripping shovel—must operate continuously day and night to justify its expensive existence. The long service life of TIGER BRAND Hoist Rope helps keep this goliath on the job with few interruptions or delays.

Over a million *with ONE*



yards of tough digging

Tiger Brand Hoist Rope



THE first TIGER BRAND Hoist Rope installed on this coal stripping shovel worked 65 shifts in 23 days before it was replaced. It moved 1,161,155 cu. yds. of overburden in those three weeks.

That's good service in a punishing coal stripping operation. This big 50-cu. yd. shovel is busy every hour of the day and night, stripping overburden for Hanna Coal Company at Georgetown, Ohio. It averages as high as 54,000 yards a day. Its hoist rope really has to be *rugged* to work at that clip. The first TIGER BRAND Rope worked so well that an identical TIGER BRAND Hoist Rope replaced it.

This is not a unique case. We know of many TIGER BRAND Ropes on heavy-duty earth moving equipment that have moved a million or more yards before replacement. In cases of easier digging, service in excess of 2,000,000 cubic yards is not unusual. On *any* job, the correct TIGER BRAND Rope gives you the longest possible service . . . steady, rope-after-rope performance that *keeps down costs*.

Send the coupon for more information.

FREE ROPE BOOKLET

American Steel & Wire
Dept. FE 25, Rockefeller Building
Cleveland 13, Ohio

Please send me, without obligation, a copy of your helpful wire rope selection guide, "The Right Rope for the Job."

Name

Company

Address

City & State

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

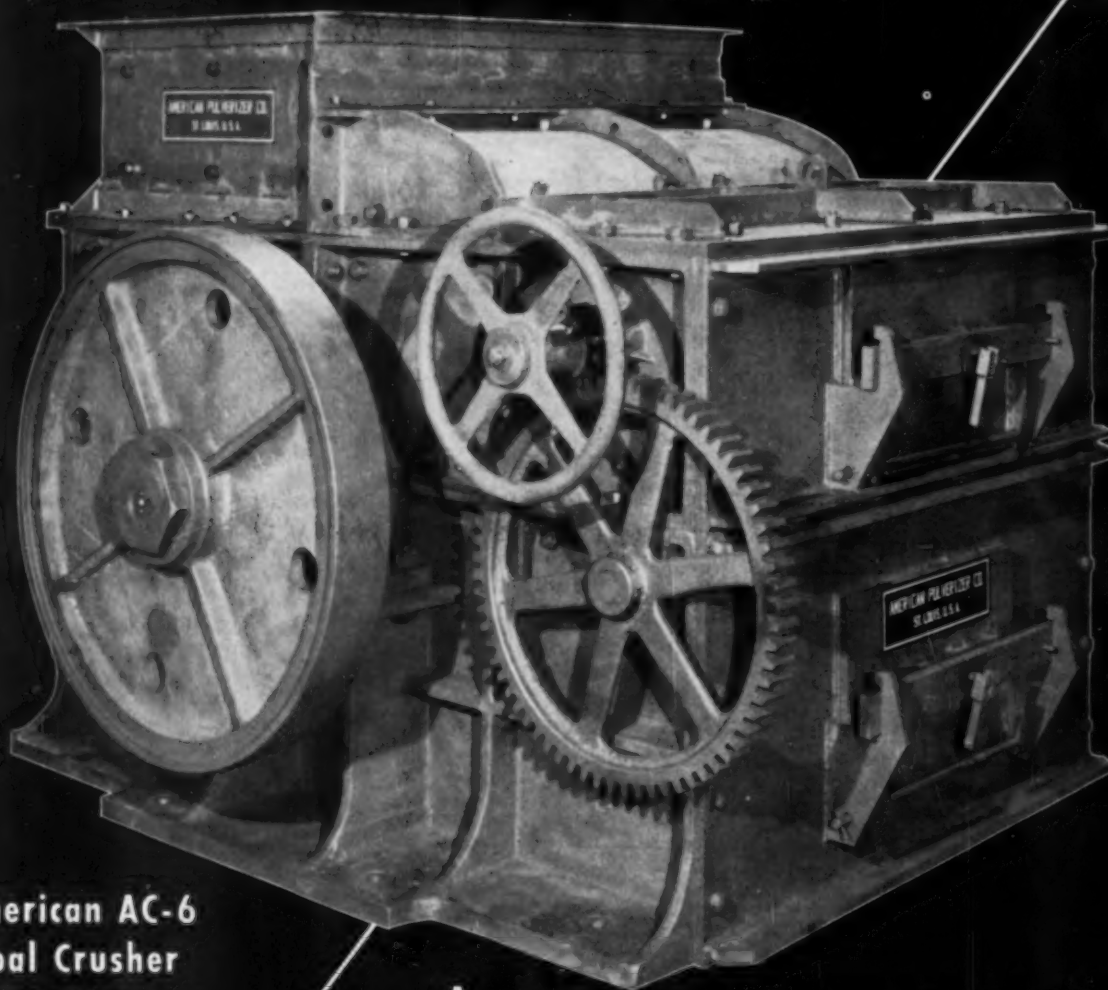
USS AMERICAN TIGER BRAND WIRE ROPE

Excelsay Preformed



UNITED STATES STEEL

QUALITY CLEAR THROUGH...



American AC-6 Coal Crusher

Capacity:
300 tons per hr.
ROM to $\frac{3}{4}$ "

American Crusher quality is being constantly reaffirmed by case histories coming in from power plants, central stations and mines throughout the country ... records which are proving beyond a doubt American's superlative performance and economy of operation. Here, for example, are the

Cost Surveys of 29 American Installations

Total Tonnage Handled.....	61,000,000 Tons
Average Age of Crushers.....	9.5 Years
Replacement Parts (Includes Standby Parts).....	1/10 of 1¢ per Ton

THERE CAN BE NO BETTER PROOF OF QUALITY!

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 MACKLIND AVE., ST. LOUIS 10, MO.



FAIRMONT

PREPARATION PLANTS

provide top separating efficiency - **ECONOMICALLY!**

- 1 Coordinated, qualified design, engineering, fabricating and erecting services.
- 2 Independent choice of equipment best adapted to your specific requirements.
- 3 Skilled pilot crews smooth out operational "know-how" of your own men.
- 4 A well-planned installation that amply meets your present needs while providing for future requirements.

When you have a coal preparation problem, let Fairmont provide a plant that will give increased separating efficiency at low operating economy. Fairmont-built Preparation Plants guarantee product uniformity and over 99% separating efficiency through a wide product size range of $\frac{1}{8}$ " to 10" in any tonnage capacity.

For *Something Extra* in upgrading your coal product . . . call a Fairmont Engineer!

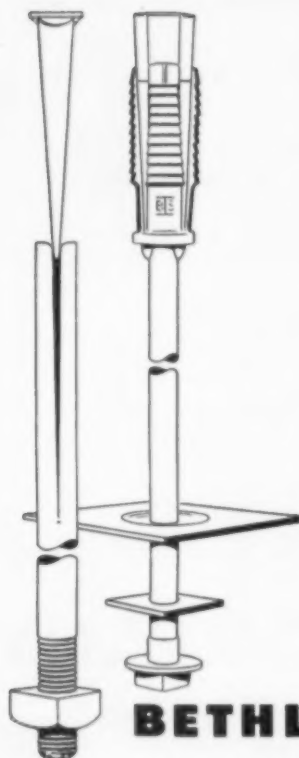
FAIRMONT MACHINERY COMPANY

FAIRMONT, WEST VIRGINIA

DESIGNERS AND CONSTRUCTORS OF COMPLETE COAL PREPARATION PLANTS USING BOTH WET
AND DRY CLEANING, CENTRIFUGAL AND THERMAL DRYING.



Look What You Get With Roof Bolting!



When you install roof bolts in place of antiquated roof supports, you promote safety by minimizing the possibility of serious roof falls. Not only that, you also get increased production, because roof bolts make possible wider openings and clearances, and more room in which to operate mechanized equipment. Ventilation is improved, too.

Roof bolts make these advantages possible because they reinforce the rock structure to prevent sagging and breaking. They also eliminate a fire hazard.

Described here are Bethlehem's headed and slotted types of roof bolts, either of which will be helpful in obtaining better, safer operating conditions.

SQUARE-HEAD BOLTS

Three sizes: A $\frac{3}{4}$ in. carbon-steel bolt, and a $\frac{5}{8}$ in. high-strength bolt, each with minimum breaking load of 20,000 lb; also a $\frac{1}{2}$ in. high-strength bolt, having a minimum breaking load of 40,000 lb.

Bethlehem also makes a hardened washer for use with these bolts. It reduces the friction between the bolt head and the roof plate that occurs when high tension in the bolt produces excessive bearing pressure. The washer permits the free use of impact wrenches, without galling or tearing of metal.

SLOTTED BOLT

A 1-in. bolt, with a centered, forged slot. No metal is removed in slotting. Opposite end of bolt has 5 in. of rolled threads. Bolt is for use with steel wedge, in $1\frac{1}{4}$ in. hole. When bolt is driven, wedge is forced deep into slot, expanding the bolt-end. Truncated-cone point prevents damage to threads. Usually comes with American Standard regular square nut.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM MINE ROOF BOLTS



You have ALWAYS
a modern cap lamp
with

WHEAT



WHEAT Electric Cap Lamps are service-engineered to *stay* on the job. Wheat design refinements do not obsolete your original lamps—you are not left with "orphans" on your hands that cannot be used along with newer models. *A WHEAT Lamp 20 years old can be charged on the latest automatic Wheat rack.*

● This is the way Wheat responsibility works for the operator . . . another of the reasons why *the Trend is to Wheat!*
Write for the latest Wheat Lamp Bulletin.

The trend
is to
WHEAT

National Mine
Service Company



has the facilities - delivers the goods

564 ALCOA BUILDING, PITTSBURGH 19, PA.

7 PLANTS TO SERVE YOU ALL-STATE DIVISION, Logan, W. Va.; ANTHRACITE DIVISION, Forty Fort, Pa.
ASHLAND DIVISION, Ashland, Kentucky; BEMECO DIVISION, Beckley, W. Va.; KY.-VA. DIVISION, Jenkins, Ky.; WESTERN KY.
DIVISION, Madisonville, Ky.; WHITEMAN DIVISION, Indiana, Pa.

IS COMPLEX
LUBRICATION
Tying Up
Man
Hours?



Cut costs with Pure's "Simplify and Save" plan



Are old lubrication methods tying up manhours?

In most plants no more than six *Pure Multipurpose Lubricants* are needed to do the work that normally requires dozens of specialized lubricants. Speeds application. Reduces inventory. Minimizes misapplication. Simplifies lubrication and stock control. Streamlines purchasing. Why not phone your nearest Pure Oil office and see how this simplified plan can cut costs for you. Reverse the charges—and call now.

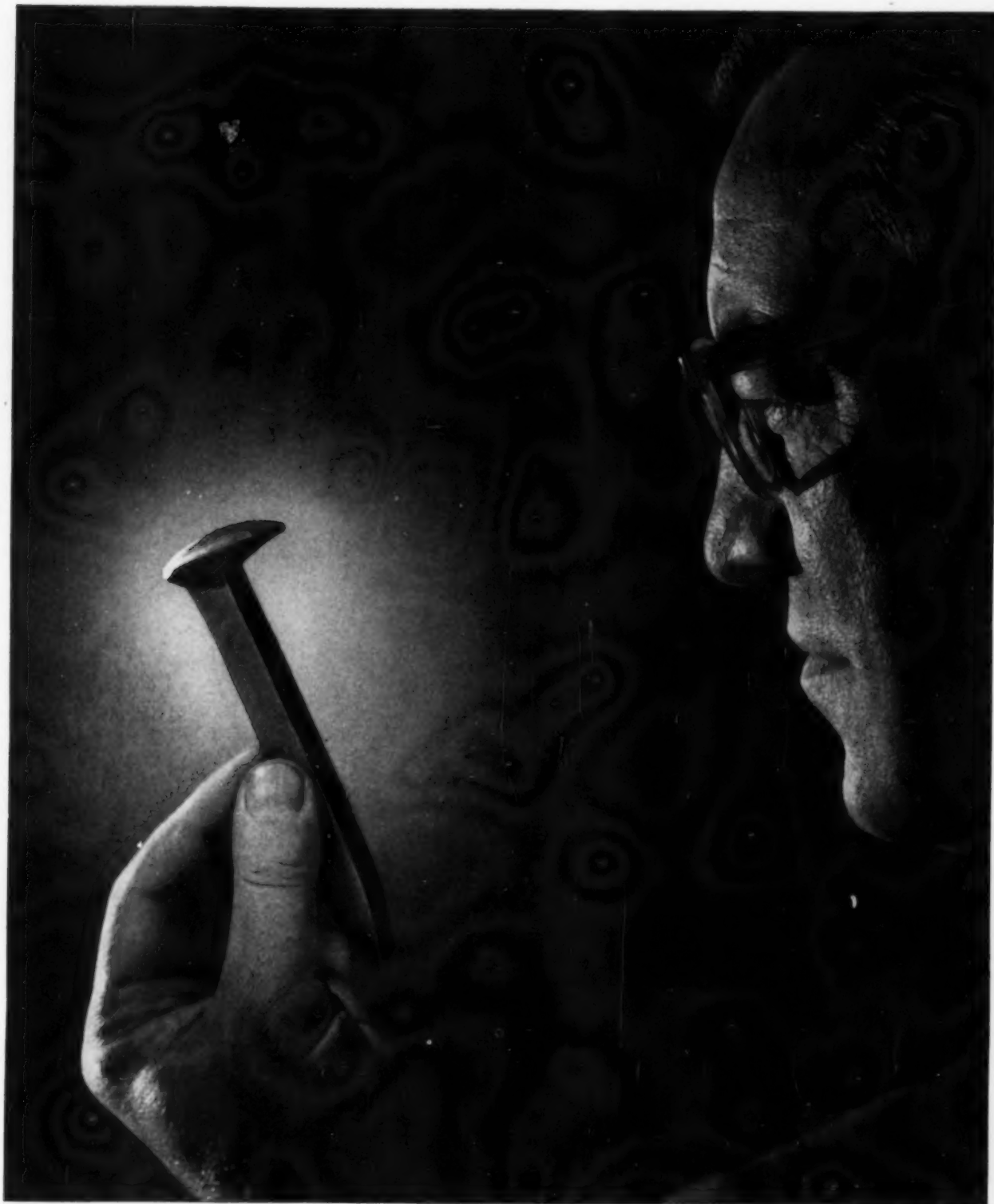


FREE BOOKLET tells you "How to Simplify and Save." Write The Pure Oil Company, 35 E. Wacker Drive, Chicago 1, Illinois.

Be sure with Pure

PURE MULTIPURPOSE LUBRICANTS

Sales offices located in more than 300 cities in Pure's marketing area



"We've always had good results with Bethlehem Spikes.
They take a clean bite, and drive fast."

We make machine and track bolts, too!



FROM THE TOP OF THE TIPPLE . . .



TO THE BOTTOM OF THE MINE



GOYNE

SOLVES YOUR PUMPING PROBLEMS

Goyne Process Pumps were designed for coal and ore preparation plants and sludge disposal service. These pumps have been working for years in many of the country's leading washers, using sand and magnetite as separating mediums. Sludge disposal installations are numerous also.

All Goyne Process Pumps feature suction pressure on the packing box. Special seals are available that admit an absolute minimum of water to the system. Seals are simple and effective and may be added to existing Goyne pump installations.

Accessibility, ease of inspection and repair, and wear adjustment, are second to none with Goyne pumps.

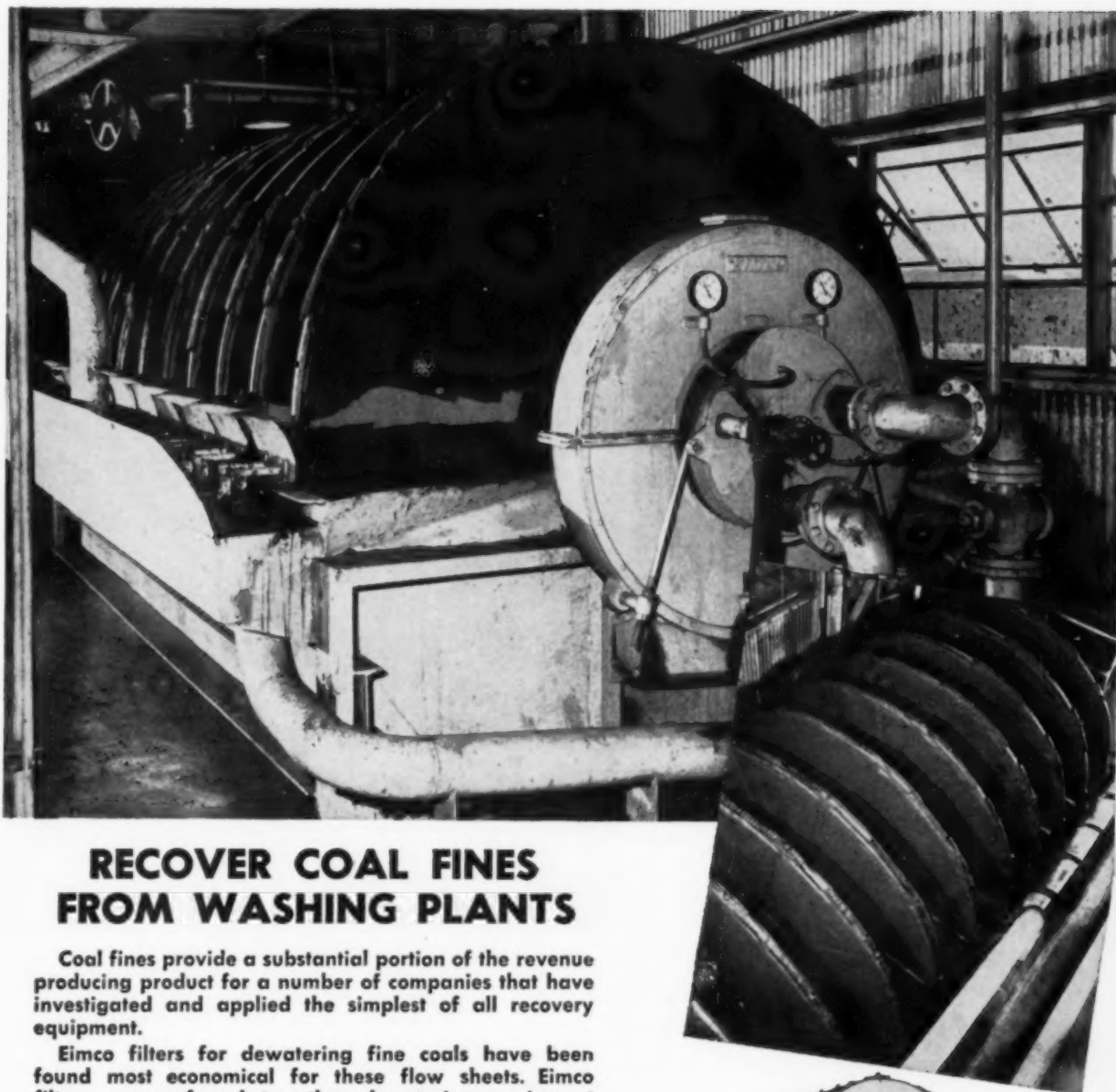
Mine Drainage Pumps have advanced rapidly in design. Illustrated is a 1000 hp. three stage pump installed in the same pump room with two slow speed eight stage pumps. The judicious use of modern alloys, in conjunction with modern design, has made these advancements possible.

We furnish pumps, check valves, strainers, and a complete line of automatic pump control systems, to enable today's mine manager to cut costs.

Bulletins are available upon request.

GOYNE STEAM PUMP CO.

ASHLAND • PENNA.



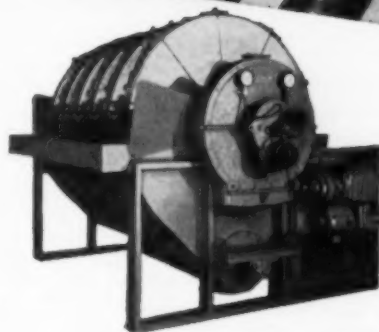
RECOVER COAL FINES FROM WASHING PLANTS

Coal fines provide a substantial portion of the revenue producing product for a number of companies that have investigated and applied the simplest of all recovery equipment.

Eimco filters for dewatering fine coals have been found most economical for these flow sheets. Eimco filters are preferred to other dewatering equipment because they are a product of the oldest, most reliable firm producing this type equipment. Eimco's experience in dewatering fine coals dates back many years before any stream pollution laws. Eimco's products are always known for their heavy-duty, precision construction. Eimco's service policy guarantees performance.

When you consider recovering fine coals, let an Eimco engineer show you filters that produce more tonnage with less maintenance, occupy less floor space, and discharge cake with lower moisture content.

Write for specific information.



THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Texas Birmingham, Ala. Duluth, Minn. Kellogg, Ida. London, Eng. Paris, France Milan, Italy

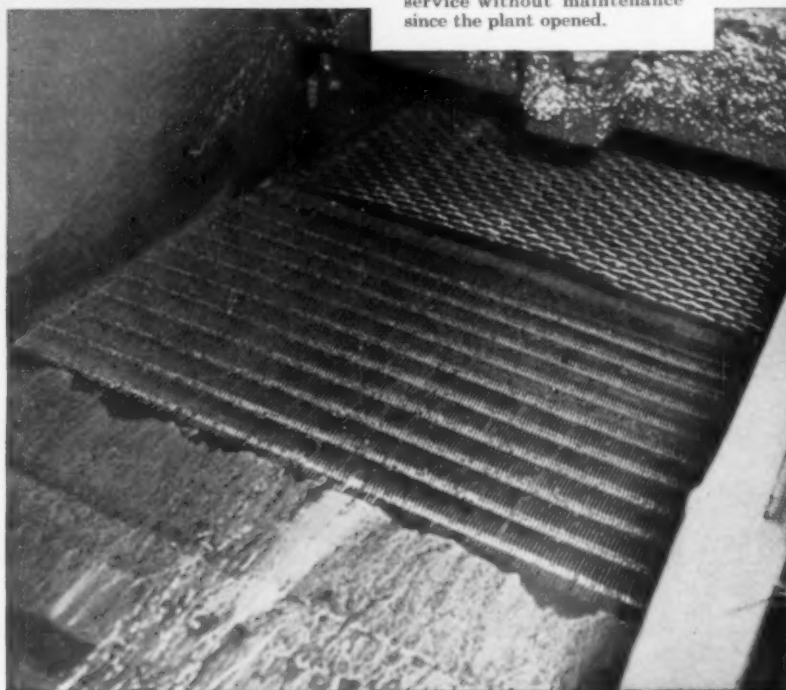


You Can't Beat An Eimco!



BOTTOM DECK of a dewatering screen with $\frac{1}{8}$ " x 3" openings is 8 and 12 gage Stainless wire. It has been in service since the plant opened while carbon steel on the top deck is replaced every six months.

HANDLING ALL THE COAL processed in the plant, this Stainless dewatering screen— $\frac{1}{8}$ " wire with $\frac{1}{8}$ " openings—has been in service without maintenance since the plant opened.



**No maintenance
needed since
April 1953 . . .**

these screens are Stainless Steel

Rosedale Coal Company, Morgantown, W. Va. opened a new preparation plant at its No. 1 mine in April 1953. To assure maximum screen life and keep operation free from interruptions, Stainless Steel screens were used in the spots where trouble most often appears.

The results to date are outstanding. F. O. Johnson, Vice-President of Operations, says, "Our Stainless installations have required no maintenance whatsoever since the plant began operating."

Working conditions are tough. The dewatering screen ahead of the Hydro machine handles 7500 tons of 4" to 0 coal a week. The Stainless wire screen has required no maintenance.

Stainless perforated plate on the air cleaning table handles an equal amount of coal with the same performance. The bottom deck of the Hydro separator and dewatering screen handles 375 tons of wet coal daily. It has given uninterrupted service while the top deck of carbon steel has been replaced every six months. And the screen on the sludge

conveyor has worked around the clock without replacement.

"There's no question," Mr. Johnson says, "that Stainless Steel is the best material to use in cleaning plant trouble spots."

And when you use Stainless, there's no question that perfected, service-tested USS Stainless Steel will give you the finest performance.

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UNITED STATES STEEL



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For safety... maximum service life...

ROECLAD TYPE SH-D TRAILING CABLE



BUILT FOR heavy duty service on such equipment as shovels, draglines and dredges. This cable is designed to provide maximum protection for workmen and longest life on the job under the most arduous conditions.

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Conductors are tinned copper wire, rope stranded for extra flexibility.

Insulation over conductors is ozone and heat resistant, high voltage rubber compound.

Cabling — Multiple conductor cables are cabled together with rubber fillers (for greater flexibility, jute fillers may be specified).

Reinforcing braid is seine twine, for greater impact and tear resistance.

Jacket is made of thick Roebling Roeprene (neoprene), lead mold cured to give the cable firmness and compactness. The jacket is highly resistant to impact, abrasion, moisture, sun-cutting and deterioration from oil and chemicals.

If you want more information call your nearest Roebling office (listed below) or your Roebling distributor, or write to John A. Roebling's Sons Corporation, Trenton 2, N. J.



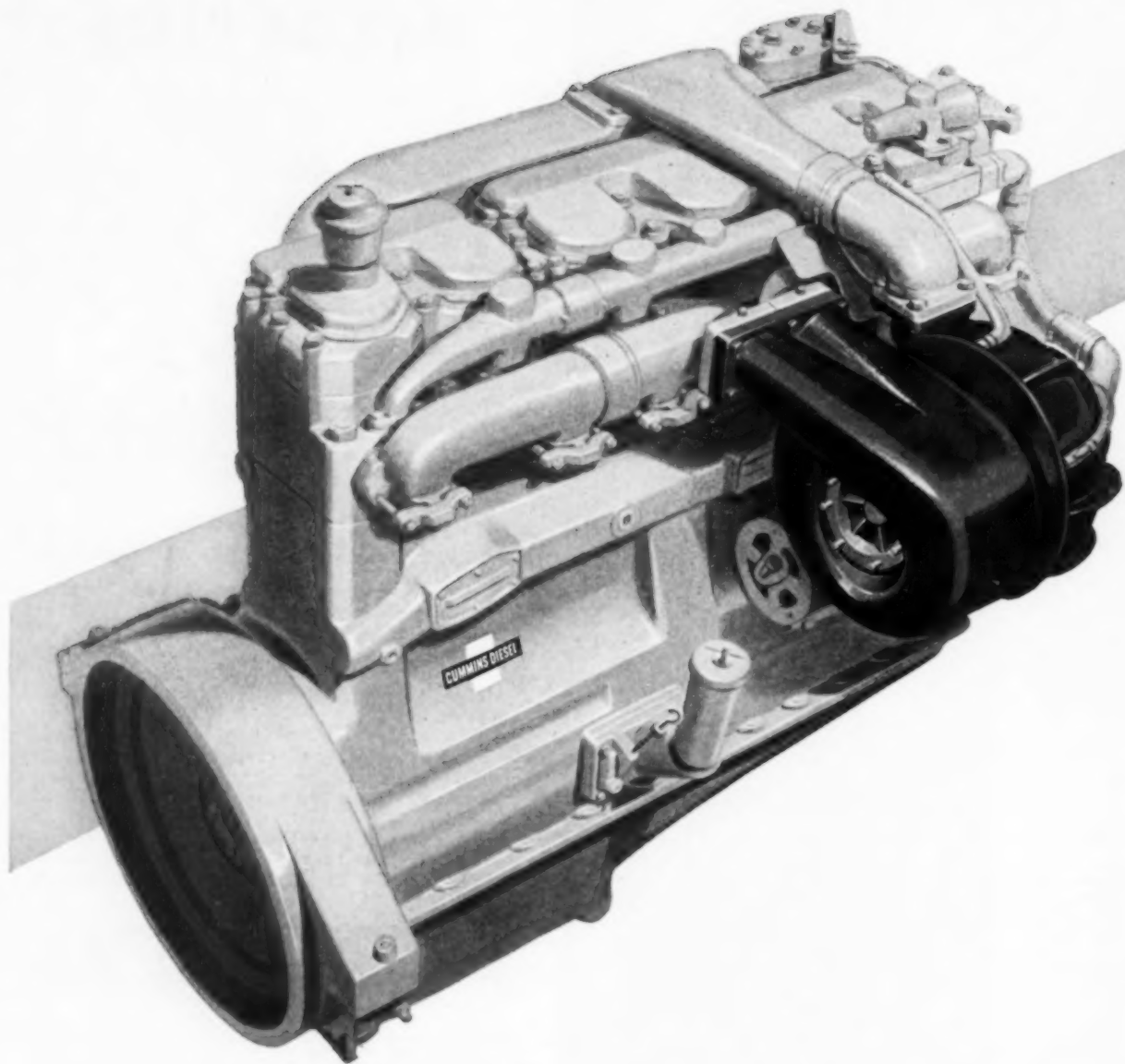
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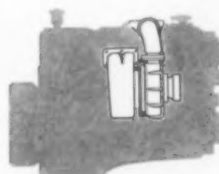
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BETTER BLASTING is a combination of the right explosives plus the right methods. The economy and flexibility of fixed explosives in blasting operations have been firmly established. Here are a few of the many ways you can cut costs even further in both open pit and underground work . . . and aid the productivity of your loading crews. If your blasting methods haven't been checked lately, why not call your nearby Atlas representative? His suggestions may help you cut costs—and increase production, too. And write us if you'd like to receive the free, informative periodical "Better Blasting," published quarterly by Atlas to bring you technical tips and product announcements.



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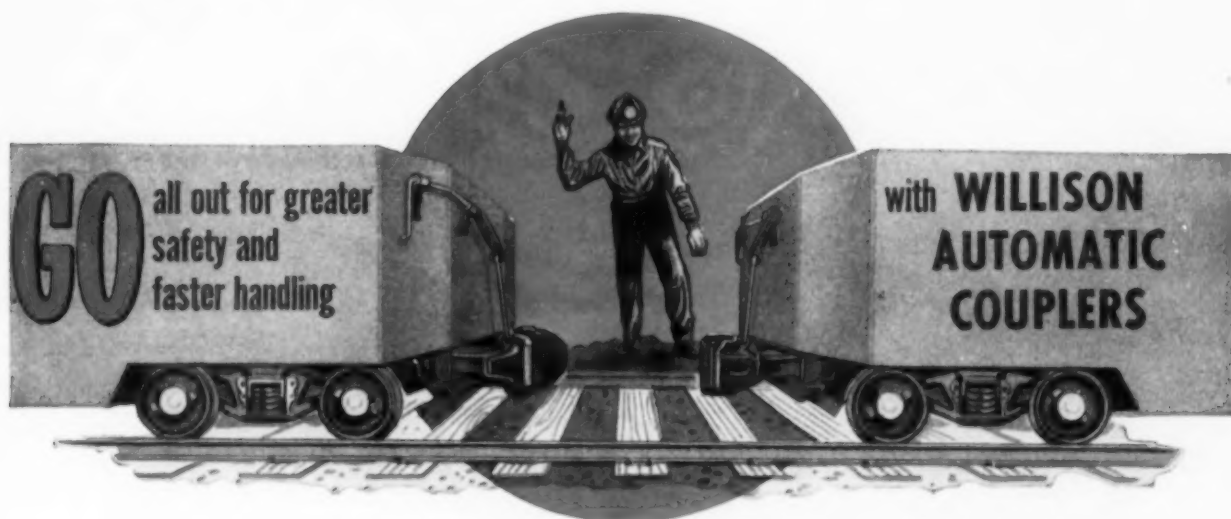
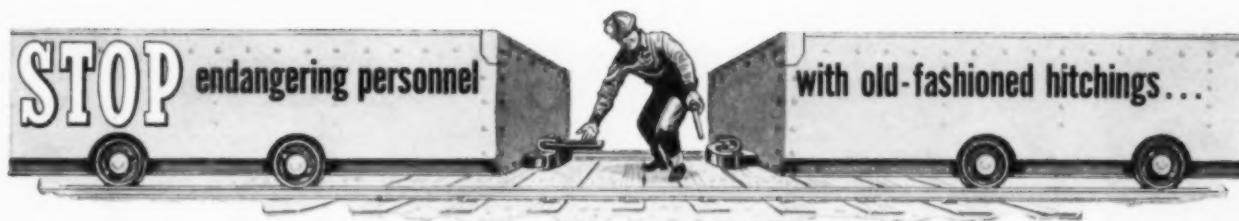
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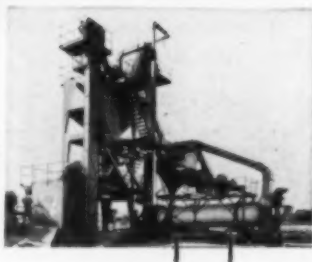
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The new No. 8 has all the inherent advantages of the Dodge Torque-Arm line. No foundation, no flexible couplings, no sliding base required—and there are no lining up difficulties. It is mounted directly on the shaft. The torque-arm, fastened to any fixed object, anchors the reducer. The unit is driven through V-belt drive. Dodge Taper-Lock Sheaves, available from stock, permit any speed ratio desired.

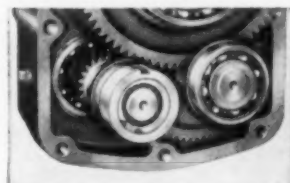
Another new member of the Torque-Arm line is the single reduction No. 11 (1.3 hp at 100 rpm, AGMA rating). Torque-Arm Reducers are now supplied, in both single and double reduction series, with capacities from 1 to 60 hp, output speeds from 12 to 365 rpm. All sizes are available with built-in backstop as well as the Tri-Matic Overload Release which is designed especially for the Torque-Arm Speed Reducer.

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Freezeproof your coal with Morton **FORMULA 5**

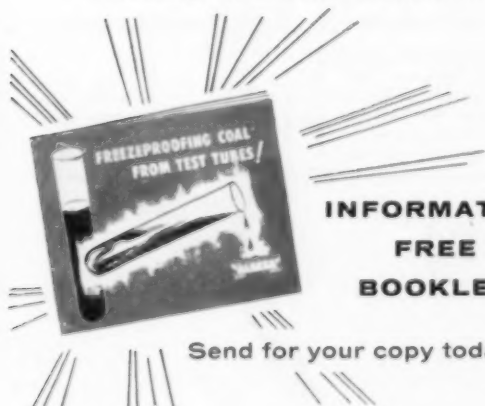
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To lengthen a Trunk Line of Plain or Reinforced Primacord, tie a **SQUARE KNOT**. Draw it up as tight as you can—it won't slip back. Caution: don't use any knot in a hole—it might break or hang up explosives when loading.



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by using **PRIMACORD**

As every blaster knows, good digging begins with good planning of the blast.

Primacord is recognized as the safest and most convenient method of firing blasts.

As the detonating agent in each hole it produces continuous priming along the borehole and tends to speed up detonation of the charge—develops more work from the explosives.

As the trunk line, it connects all holes and enables the Blaster to plan the shots for proper sequence, with respect to the open face or the most logical direction of movement of the bank. And, while Primacord detonates at a speed of nearly four miles per second, the infinitely small time delay between holes and rows of holes has been sufficient to relieve burden and produce better fragmentation.

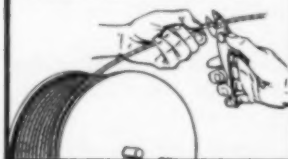
Primacord is light in weight, flexible, strong. It is easily hooked up as shown here. And it's available in Plain, Reinforced, Wire Countered and Plastic Reinforced—each designed to give you the best results under certain conditions of service.

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Cut the Primacord off the Spool Immediately

Make this a safety habit! As soon as you have taken off the length of Primacord you need for a down-hole or for a trunk-line, cut it off the spool! Don't waste a second—do it now!



To connect the Detonator with the Primacord Trunk Line

use **FRICTION TAPE**. You can detonate Primacord with fuse and cap or electric blasting cap. Lay the cap alongside of the Primacord with the business end of the cap pointing in the direction that the Primacord will detonate. Tape the two snugly together, so that you have a tight connection.

To connect a Branch Line with the Trunk Line

Use this **HALF HITCH** for Plain and Reinforced Primacord. Draw it up as tight as you can, and be sure the Branch Line leads off at a **RIGHT ANGLE** to the Trunk Line.

To connect a Branch Line of Plastic Reinforced or Plastic Wire Countered Prima- cord with the Trunk Line

use this **DOUBLE HITCH** in the textile-covered Primacord Trunk Line. Draw it up as tight as you can, and make sure that the Branch Line leads off at a **RIGHT ANGLE** to the Trunk Line.

PRIMACORD®

DETONATING FUSE

PROVED AND APPROVED

FEBRUARY, 1955

IVAN A. GIVEN, EDITOR

Better Than Fair

NOT EASY STREET but still something a great deal better than 1954 is the very real coal prospect for 1955, particularly for bituminous. Problems still remain, further losses will be incurred in certain markets and, in anthracite, sales of industrial coal, though increasing, have not yet picked up enough momentum to offset the erosion of what still is anthracite's major market—home heating. In bituminous, however, the comeback in steel and general industry, reflecting the Nation's climb out of recession, will boost consumption enough to not only offset further drops in railroads, exports and home heating, but also to raise the 1955 tonnage substantially—up to 10% or more.

Change Favors Coal

The events of 1954 and 1955, however, have a significance far beyond welcome relief from a hardship existence—a significance that reflects the changing competitive picture. For the competitive picture is changing. Oil, though it increased its supply of home-heating fuel again in 1954, lost sharply in the heavy-fuel market, and the signs were multiplying that it has about reached its peak in competitive power. Natural gas still is moving up, but here too, the sledding is getting harder and it may be closer to its competitive peak than might appear at first glance. It may be difficult to accept the concept that there can be an end to competitive losses—at least on past scales—but the evidence indicates it more and more.

No Substitute

Both oil and natural gas could revert to a give-away philosophy and thus stop the swing back to coal. But in view of rising costs all along the line—if for no other reason—it is unlikely now and will be even more unlikely in the future. Will the atom

take over in power generation? Again the answer is "No!" Though there are knotty unsolved problems, power from the atom will become a major factor sometime, but hardly in the next 10 years. Even if it does become a major factor, coal and other fuels must grow with it to meet the growing demand for energy.

Rightfully Earned

Bought by hard work and heavy investments of money, brainpower and faith—that is one way of describing the more-favorable position coal now enjoys for today and for the future. In other words, coal has earned its way—and will continue to earn its way in the days and years to come. The rollcall of progress in production, preparation and safety; in research and market development; and in organization to bring maximum effort to bear on the solution of industry problems, briefed on the following pages of this issue, is all the evidence that it is necessary to offer to prove the point.

New Opportunity

"Better than fair" thus becomes a reasonable description of coal's outlook for 1955 and the years beyond. In fact, there is justification for going even farther and concluding that coal could be entering into an era of prosperity unparalleled in all its previous history. At the very least, coal has a new opportunity for expanding its sales and upping its profit through improving product and service, thus capitalizing on a more-favorable consuming climate. Mined safely and at lower and lower cost, prepared to give the consumer the maximum in value and convenience, made more useful through research, and brought to more and more users through modern merchandising and service, coal will truly be the fuel of the future, as well as today.

COAL

Problems and Progress in '54 The Road Ahead in '55

Bituminous comeback picks up momentum as business pulls out of slump. Warm weather and increased competition hold anthracite back.

New organizations, including the "Coal Executive Group" and "Minute Men," work to improve coal's effectiveness on all fronts.

Coal men make progress toward development of a realistic fuels policy, and toward elimination of governmental practices leading to discrimination against coal.

No contract reopening permits uninterrupted concentration on cost-cutting, quality-improvement and safety programs.

THIRTEEN proved to be a good rather than a bad omen for the bituminous industry in 1954. The thirteenth week of the year, which ended April 3, was the low point, excluding strike and holiday periods, in the latest slump in bituminous production, which started back in 1948. Since April 3, the trend, with a few exceptions, has been up. A balancing of gains and losses indicates that it will continue up in 1955, with a minimum gain of 20 to 25 million tons.

Anthracite, however, failed to share in the 1954 comeback. Limited primarily to the home-heating market, which is the main target of oil and natural gas—and again plagued by warm weather, anthracite ran consistently under 1953 figures a large part of the year. And while 1955 might bring a break in the weather, there is no doubt that competition—especially natural gas—will be tougher. Consequently, a further drop is ex-

pected in 1955, and one major producer formally announced that it will tool down with this in mind.

But to keep the expected drop to a minimum, and to set the stage for progress in the future, anthracite stressed cost reduction, quality improvement and better merchandising. It also laid plans to get back to the commonwealth-sponsored production-control plan for stabilizing marketing, which was honored more in the breach than in the observance throughout much of 1955—a situation that was complicated by a rise in "bootleg" production. In addition, anthracite also worked busily at fitting another string to its bow—industrial fuel.

Anthracite Woos the People

Getting the word to the user—actual and potential—was the object of concentrated effort by anthracite in 1954, working jointly with distributors

and dealers in the "PR," or public relations, program.

One highly visible element in the public-relations program, sponsored by the Anthracite Industry Council through the Anthracite Information Bureau, was the "Anthracade" motor caravan, which played to good houses in numerous consuming centers, and even did its stuff in Washington in the campaign to get a better break in government fuel purchases. AIB also sold thermostats, issued handbooks on anthracite burning equipment and methods, set up a speakers' bureau, released "Black Diamonds," a 29-min full-color sound movie, and conducted automatic-equipment exhibitions at "Architects' Headquarters" in New York, featuring, among other things, the Lehigh Valley "Ashaway" ash-removal system. The emphasis on modern equipment also was picked up by many individual companies with units all the way from draft controls up to complete automatic heat-

The Coal Rollcall...1954 and 1955

(1954 estimated or projected from part-year data)

Bituminous Production

1954—DOWN, to 392,000,000 tons, 14.3% under 457,290,000 tons in 1953.

1955—UP, at least 5% and possibly 10% or more.

Anthracite Production

1954—DOWN, to 27,118,000 tons, 12.4% under 30,949,000 tons in 1953.

1955—DOWN, possibly 10% or more under 1954.

Coal Prices

1954—DOWN for both bituminous and anthracite, reflecting stiffer internal competition arising out of reduced demand. Estimated average bituminous value for 1954 is \$4.82, compared to \$4.92 in 1953; anthracite, \$9.65, compared to \$10.15.

1955—STEADY to firmer; no major price rise, however.

Oil Supply

U. S. PRODUCTION—2,312,209,000 bbl in 1954, against 2,359,998,000 bbl in 1953.

IMPORTS—DOWN slightly, from 383,157,000 bbl in 1953 to 380,000,000 bbl in 1954; residual imports also down from 136,209,000 to 132,000,000 bbl.

TOTAL SUPPLY—NEARLY EVEN, at 2,700,000,000 bbl in 1954 against 2,785,000,000 bbl in 1953, allowing for exports, imports and changes in stocks.

1955—SLIGHT RISE in consumption, accompanied by similar rise in domestic crude production and imports.

Natural Gas

UTILITY SALES—UP in 1954 to 58.4 trillion therms, or 9.8% over 1953 sales of 53.2 trillion. In contrast, sales of manufactured gas were off 40% from 835.7 million therms to 520 million. Mixed gas sales were up slightly from 2.4 trillion therms in 1953.

1955—UP again for natural gas, with perhaps half the gain of 1954, though some gas optimists see the possibility of exceeding the 1954 increase; DOWN again for manufactured gas; STEADY or slightly up for mixed gas.

Coal for Railroads

1954—DOWN, to 17,000,000 tons, a drop of 25.9% from 22,949,000 tons in 1953.

1955—DOWN again, 3 to 5 million tons.

COMPETITION—Diesel fuel, UP 8.4% from 3 to 3¼ billion gal; fuel oil, DOWN 52% from 969 to 470,000,000 gal. Outlook for 1955: UP for diesel fuel; DOWN again for fuel oil.

Coal for Export

BITUMINOUS—DOWN in 1954 to 30,926,000 tons, a drop of 8.4% from the 1953 total of 33,767,000 tons. Overseas shipments increased from 14,176,000 to 15,088,000 tons, but shipments to Canada dropped from 19,590,000 to 15,838,000 tons.

ANTHRACITE—UP in 1954 by 6,000 tons from 2,724,000 tons in 1953 to 2,730,000 tons in 1954. A drop

to Canada of 255,000 tons—2,602,000 tons to 2,347,000—was more than offset by a rise in overseas shipments from 122,500 to 383,400 tons.

1955—DOWN for bituminous to Canada as a result of further railroad dieselization and other competition, but not as much as in 1954; EVEN OR DOWN slightly for anthracite; UP 3 to 5 million tons in bituminous overseas and slightly for anthracite.

Retail Bituminous

1954—DOWN, approximately 5 million tons, or 8.2%, from the total of 61,295,000 tons delivered by dealers in 1953.

1955—DOWN again, possibly 3 to 5 million tons.

COMPETITION—Oil, UP modestly; natural gas, UP sharply, with number of residential customers increasing from 19 million in the fourth quarter of 1953 to 20 million in the fourth quarter of 1954. Both fuels will show similar gains in 1955.

Coal for Kilowatts

1954—UP slightly, to 114,000,000 tons from 112,283,000 tons in 1953.

1955—UP again, by 20,000,000 tons for consumption and addition to stocks (see "More Kilowatts from Coal," January, 1955, *Coal Age*, pp 54-55).

COMPETITION—DOWN for oil to 70 million barrels, against 82,838,000 in 1953, or 12%; UP for natural gas from 1,034,272,333 MCF to 1,237,000,000, or 19½%. Outlook for 1955: LITTLE CHANGE in oil burn; UP for natural gas, but at a much lower rate.

Coal for Steel

1954—DOWN, for the biggest individual loss in 1954. Coal for by-product and beehive coke alone dropped from 112,874,000 tons in 1953 to around 86,000,000 in 1954—a decline of 26,874,000 tons, or 23.8%. With steel and rolling mills added in, the 1954 total was 90,250,000 tons, against 119,081,000 tons in 1953, a drop of 25.1%.

1955—UP by around 15,000,000 tons in the expectation that steel production will approximate 100,000,000 tons, compared to around 88,000,000 tons in 1954.

Coal for Industry

1954—DOWN some 16,450,000 tons to 89,350,000 in 1954, including cement mills, a drop of 15.5% from 105,799,000 tons in 1953, primarily because of decreased business activity.

1955—UP, 7 to 10 million tons, in line with increased business activity.

COMPETITION—Oil and natural gas UP slightly in 1954; no major additional growth in 1955; consumption gains will reflect primarily increased activity at plants already served.

Bituminous Stocks

1954—DOWN, to approximately 70,000,000 tons, industrial and retail, on Jan. 1, 1955, compared to 80,614,000 tons on Jan. 1, 1954, a drop of 10,614,000 tons.

1955—LITTLE CHANGE from the Jan. 1 level of 70 million tons.

ing units—for example, Hudson Coal's "Sterling Anthratherm."

Anthracite, however, dropped its industry research program in view of the work being done by individual companies, the U.S. Bureau of Mines and Pennsylvania State College. As an example of individual-company efforts, Philadelphia & Reading contracted with Hydrocarbon Research, Inc., for a long-range experimental program in anthracite gasification. In other directions, previous efforts were paying off, among other ways, in additional markets for silt and other fines for power-plant use. A by-product was a growing conviction that power-plant fuel and gas might be the anthracite backbone a few years from now.

Management, men and union worked fairly smoothly together, for the most part, in advancing anthracite's interests, but there were exceptions. The outstanding one was the refusal of Lehigh Navigation Coal Co. employees to abandon practices leading to high costs, with the result that the company ceased operations. At the end of the year, however, some of the closed collieries had been taken over by other companies and were back in production.

Cost Drive Intensified

Along with the closing of high-cost operations, the anthracite industry turned still more to stripping and bank reclamation to keep costs down. There was an increase in longhole drilling underground, and also in the use of loading machines and continuous miners.

The anthracite situation, in addition to bringing about increased stress on cutting costs, also made the water problem more acute in 1954. The pressure for economy in the face of declining sales resulted in cessation of pumping in some locations and announcement that it would be terminated at others. The lively prospect of losing several neighboring operations as a result of these moves resulted in intensification of a campaign for state and federal aid in keeping ahead of the flood, with not too much success. Biggest disappointment was a ruling in November that the President could not grant money from his emergency funds, leaving the prospect bleak—at least for the present. It was followed Dec. 20 by an announcement that a special study commission set up by the Pennsylvania governor had recommended that a federal plan for a \$400,000,000 drainage tunnel from near Scranton to Conowingo, Md., be shelved as too

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expensive and impractical a project.

Along with getting costs down, anthracite companies also were seeking new sources of income through diversification. Glen Alden, for example, let it be known late in December that it was interested in going into other products so that its income would not be dependent solely upon anthracite production and sales.

Bituminous Down With Business

Competition continued to plague bituminous coal in 1954, but losses on this score were far outstripped by losses resulting from the 1954 business recession, particularly in steel.

With one exception, the bituminous record in 1954, as summarized in "The Coal Rollcall," p 55, was one of losses. The exception was electric utilities, which increased their burn 2 million tons in 1954. The biggest single loss resulted from the steel recession, which reduced the demand for coal for coking and for plant operation 29 million tons. Published estimates of consumption in 1953 and 1954 indicate that the total loss to bituminous was 63,000,000 tons. Production suffered to the tune of an additional 10 million tons taken out of stockpiles.

Approximately 60% of the 1954 non-steel loss can be laid to oil and gas. Over 20 million tons represented drops in retail deliveries, in exports to Canada (particularly for railroad use), and in railroad consumption in the United States, including power plants, shops and stations. However, in one important consumption category, "Other Industrials," the loss to competition was only nominal in 1954, compared to the recession loss. One basis for this conclusion is a recent survey of fuel use by Ohio industrial plants, conducted by *Keystone Coal Buyers Manual*, a Coal Age affiliate.

Keystone, among other things, asked Ohio plant operators if they had changed fuels in the past 5 yr or contemplated a change in the future. This brought a few reports that the changes had been in the direction of coal. The number in the other direction, however, was low and represented only a

relatively small tonnage. Therefore, in Ohio at least, the recession, rather than competition, was the major factor in the "Other Industrials" decline in 1954.

Oil Uneven; Gas Up in 1954

In the "What Might Have Been Department," coal suffered both losses and gains in competition with oil, but took losses across the board with natural gas.

With adjustments for exports, imports and changes in stocks, the supply of oil products to the United States in 1954 was almost the same as in 1953. Gasoline was up a fraction, kerosene was almost the same, but the supply of distillate oils rose approximately 4%, or 17,000,000 bbl, equivalent to 4 million tons of coal, perhaps two-thirds of which could be considered an actual loss.

Other oil products were up or down by fractions, with the exception of residual fuel oil, which went off approximately 60,000,000 bbl, equivalent to 14 million tons of coal. Part of the decline reflected the recession, but a fair share was a result of coal and natural gas taking over, with coal benefiting to the tune of possibly 2 to 4 million tons. One by-product was a cut of around 4,000,000 bbl in residual imports, equivalent to a million tons. However, even with this reduction, residual imports still were running at a rate of over 30 million tons a year. The drop in residual demand in 1954 as a result, was met by cutting U. S. production.

The natural-gas picture, however, was something else again, with pipeline companies and distributors giving trouble not only to coal but also to oil. Sales of natural gas by pipe lines and utilities increased from 53.2 trillion therms in 1953 to 58.4 trillion in 1954. The increase was equivalent to approximately 20,000,000 tons of coal. The big rise was in industrial and commercial sales. The electric utilities, for example, increased their gas burn by around 8 million tons coal equivalent in 1954.

By regions, the major gains were in the Southwest, Mountain and Pacific areas, already consuming over 40% of the natural gas sold by utilities. Sizeable percentage gains also were racked up in the Middle West and Northwest, taking about one-third of the sales, and also in New England—so far a relatively small consumer of natural gas. In the Middle and South Atlantic areas, the gains were relatively smaller and, in fact, losses of 4.1 and 6.3% were racked up in the third quarter of 1954, compared to the same period in 1953.

Up to 75% of the gain made by gas was in areas that could be served with coal, and consequently it can be considered that the loss to anthracite and bituminous was around 15 million tons in 1954. Another gas gain is in prospect for 1955 and again will be made at the expense of oil as well as coal. One bet, however, is that it will not be over half that in 1954 in terms of coal equivalent. As for oil, the bet is that it will gain slightly in the domestic field and lose rather heavily again in industrial.

Organization for Progress

To put a better army in the field against competition in the future, the bituminous industry worked along three major lines in 1954:

1. Better industry organization.
2. Development of a hard-hitting merchandising program.
3. Elimination of governmental discrimination against coal and restoration of equal competitive opportunity.

Concentrated top-level thinking was brought to bear on bituminous problems early in 1954 with the first meeting of the "Coal Executive Group" in New York April 23. Several subsequent meetings brought about, among other developments, the establishment of committees to study various improvement programs—for example, mergers for added strength on all fronts, including in the market place.

The failure of one attempt at a merger in 1954—between the Sinclair and Truax-Traer stripping organizations—because of legal difficulties did not decrease interest in the possibilities, and work was continuing on other suggestions at the end of the year. At the same time, the industry made strides in building up striking force—particularly in the market place—by concentrating more and more tonnage in the hands of individual marketing agencies. The possible benefits of such concentration also resulted in a rebirth of interest in the regional marketing agency. Anti-trust officials were sounded out as a part of investigation of the possibilities, and were reported to be favorably inclined.

A "Special Committee on Competitive Fuels," announced Dec. 17, was another significant organization step in 1954, taken in accordance with a resolution adopted at the November meeting of the National Coal Association. Committee objectives are a reduction in residual fuel imports, elimination of natural-gas dumping and control of natural-gas importation, and it was given exclusive authority to speak for the coal producers on these problems. It was further announced

that the committee had met with oil and gas spokesmen to acquaint them with its position, and that it would frame a legislative program for submission to the next Congress.

Mobilizing Government

Growing appreciation of the industry's basic importance as an employer and as a source of vital energy and raw materials in both peace and war was reflected in 1954 in the organization of special conferences and committees on both state and federal levels to help coal with its problems.

The first formal action in the mobilization of governmental resources to help coal where necessary was an organization meeting, April 28, of the "Governor's Permanent Fuel Conference." Made up of the governors of 16 coal-producing states, the conference's objective is fostering production and employment by appropriate action at the state level, such as, giving coal a fair chance at state business, backing up coal in requests for federal and Congressional action, etc.

Defense and other considerations were the moving forces in the establishment of two administration committees to deal with fuel problems following presentation of coal's case to President Eisenhower June 29 by an operator group led by Senator Cooper, of Kentucky. On July 16, the President named a six-man "Interdepartmental Committee on the Bituminous Coal Industry." Charged with studying the needs of the industry and recommending policy, the committee is composed of representatives of the Interior, State, Commerce, Labor and Defense departments, with Dr. Arthur S. Flemming, director of defense mobilization, as chairman. In September, coal set up the "Bituminous Coal Industry Committee" to work with the interdepartmental committee.

President Eisenhower acted again on July 30 with the appointment of a "Cabinet Committee on Energy Supplies and Resources Policy." With Dr. Flemming again chairman, this committee is composed of the heads of State, Defense, Justice, Interior, Commerce and Labor. It was directed by the President to "undertake a study to evaluate all factors pertaining to the continued development of energy supplies and resources and fuels in the United States, with the aim of strengthening the national defense, providing orderly industrial growth, and assuring supplies for our expanding national economy, and for any future emergency."

Dr. Flemming promptly noted that the two committees would work to-

gether, and on Sept. 20 named a three-man task force, including one coal man, to report on the fuel problem for the guidance of the cabinet committee. Though the committees were requested to report Dec. 1, the date was extended to provide additional time, and as a result none of their findings were yet available at the end of the year.

"Total Selling" Pushed

New techniques, new equipment and greater effort on the market-promotion front began to show promise for the bituminous industry in 1954.

"Total selling" perhaps could be cited as the keynote of activities in merchandising in 1954, reflecting in turn growing appreciation of the need for a real selling job, starting with concentration of tonnage in organizations large enough to do a good marketing job and ranging on through to development of new burning units and methods for alleviating or eliminating nuisances in coal burning, such as, smoke and fly ash. Producer and association efforts were paralleled by stepped-up progress of the American Coal Sales Association, National Retail Coal Merchant's Association, local retail organizations, and individual wholesalers and retailers, with help from equipment manufacturers.

Research to give added force to coal sales efforts got new impetus from the dedication of the first industry-owned laboratory for BCR, at Columbus, Ohio, in 1954. The lab provided quarters and facilities for such new studies as that of stack dust, and also was the scene of the first "Techno-Sales Conference," March 23, designed to harness the work of the researcher to that of the salesman.

On the equipment front, production of the 1,000th Campbell stoker on Dec. 7 was a further sign that real hope for progress in the home market still exists. Marketing of this unit previously had been taken over by Automatic Solid Fuels, Inc., owned jointly by producers and retailers. A vigorous sales program inaugurated early in the year was supplemented toward the end by "Program FES," a field-engineering service designed to aid dealers in servicing Campbell stokers.

The university town of Bloomington, Ind., was being cited at the end of the year as an example of some of the possibilities of modern retail merchandising. Here, among other things, the dealers operate on a seasonal basis, delivering automatically in line with use and also removing ashes. It is almost literally true that burning oil or gas is a social error in Bloomington. Elsewhere throughout the Nation,

most retail dealers seriously intent on maintaining and building their coal business generally expect a profitable future on at least the same if not a higher volume.

On the wholesaling side, the Market Promotion Dept. of the National Coal Association, with a new organizational setup and revised objectives, set about pioneering "Total Selling," which involves joint producer-retailer co-operation in the form of "Minute Men" groups, and the presentation of a complete package—coal, equipment, and coal- and ash-handling facilities. Signs were multiplying that the technique pays off. In Indianapolis, for example, in a fight that began last February, the Minute Men by late November had saved a school from going to oil and thus preserved a 3,000-ton-a-year market.

As the industry turned more and more of its thinking to sales, at least three problems popped up:

1. A scarcity of well-trained salesmen, fuel engineers and service men.
2. A scarcity of manuals and material that could be readily used by application engineers and architects and designers.
3. Continued coolness on the part of most equipment builders to the idea of pushing coal equipment, coupled with the same attitude on the part of many architects and designers.

These three problems were being made the objective of greatly increased effort for the future.

Fairer Policy for Coal

Governmental discrimination against coal in various ways was the target of an improved organization with clearer objectives in 1954.

The appointment of two special governmental committees, as noted under "Mobilizing Government" earlier in this report, were evidence that better organization and greater pressure were beginning to be effective in the removal of governmental barriers against free access to markets on a competitive basis. These barriers range all the way from active support of natural-gas expansion to purchasing policies tending to drive down the price of coal to new low levels. TVA, for example, came under sharp criticism during the year for its buying policies, and other federal agencies also were singled out by both bituminous and anthracite.

With TVA, in particular, pleading necessity under the law, attempts were made to attain the desired result from other directions. Secretary of Labor Mitchell, for example, announced July 13 that a safety drive was being aimed at the smaller, mostly nonunion, mines

supplying TVA. Next, on Dec. 15, following representations by both the union and the operators, he announced that he would fix minimum wages in coal mining for application under the Walsh-Healy Public Contracts Law.

One battle carried on for many years—though lately by only a part of the industry—was finally lost May 13 when President Eisenhower signed a bill authorizing participation in the construction of the St. Lawrence Seaway. Coal also was set back in its attempts to cut residual imports but went into 1955 with support from independent oil producers and from other industries troubled by rising imports of other materials and products. Aside from the fact that victory still is a possibility, the hue and cry apparently held residual imports in check for at least part of the year, with the result, as previously noted, that the total dropped slightly in 1954.

Proposals to import natural gas from Canada, which had not-too-veiled support from government officials, were a prime target of coal-industry efforts. In addition, the industry increased its efforts to secure adoption of a fuels policy that would channel gas—and oil—to higher-echelon markets and prevent low-grade use and dumping. Action of the Supreme Court in affirming FPC jurisdiction over wellhead prices of natural gas was considered a setback not only by coal but by gas producers, state officials, bankers and others, leading to the hope that Congress would remedy the situation by special legislation at an early date.

Coal actively campaigned for more realism in freight rates, and concessions in rates, particularly on fine coal, began to reflect this pressure. As another string to its bow, coal significantly increased its use of the waterways, and gave thought to overland belts and pipe lines. The government also heeded coal's representations for a better break on foreign business to the tune of a 10-million-ton program of shipments by the Foreign Operations Administration to friendly nations, announced Aug. 5. Shipments were under way at the end of the year.

Program for the Future

National Coal Association directors and certain special committees establish the main points of coal's program for fair treatment in resolutions adopted in December.

1. Quantitative restriction of residual-oil imports and equalization of tariffs with other petroleum products.
2. Elimination of dumping of natural gas at less than cost.
3. Control of natural-gas importation.

4. Opposition to government subsidization of atomic power plants.

5. Opposition to the construction of hydro and steam plants with public funds.

6. Adequate protection for coal in reciprocal trade agreements.

7. Elimination of discrimination against coal in government purchases.

8. A proper percentage depletion allowance in relation to the allowance granted competitors.

9. Fair treatment in income and payroll taxes.

10. Immediate elimination of the transportation tax on coal.

11. Opposition to unreasonable increases in the minimum wage prescribed under the Fair Labor Standards Act.

12. Elimination of the practice of loading deficits in certain railroad services onto other commodities, including coal.

13. Retention of the rule requiring the ICC to consider, in rate changes, the effect on traffic.

14. Opposition to any change providing additional exemptions from the commodities clause of the Interstate Commerce Act.

The Labor Front: Quiet

With no contract reopening, attempts to organize nonunion operations and welfare-fund affairs occupied the stage in 1954.

Major victory in the union drive to organize nonunion operations was acceptance of a contract by the West Kentucky Coal Co. March 1. Drives in other key regions—particularly in Ohio, Pennsylvania and eastern Kentucky—brought little success to the union, however, leaving the percentage of nonunion tonnage still at 20 to 25. In fact, as the year wore on, the union was confronted by a number of contract cancellations, though not enough to be considered a trend. Nevertheless, the threat of wholesale cancellations continued at the end of the year.

Declining revenues from the tax of 50¢ on anthracite and 40¢ on bituminous, and also an increase in withholding of payments in both industries, led to additional suits to recover delinquencies, and to the urging of crack-downs by a number of companies complaining of the significant competitive advantage accruing to the withholders. Anthracite pensions were cut from \$100 to \$50 per month in January, and death benefits from \$1,000 to \$500. In the same month, the bituminous fund eliminated benefits to 35,000 disabled miners and their families, effective March 1. These payments had been running around \$16 million per year.

Business in 1955

By ROBERT P. ULIN
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McGraw-Hill Publishing
Co., Inc.

Much better in 1955 than in 1954: that is the picture for business as a whole. At the start of the new year consumers were buying heavily and business inventories were low. These two factors promise to keep industrial production high in the first half, and probably most of the year.

As one indicator, the Federal Reserve index of industrial production may reach 132 by mid-year. Last June it was 124. In terms of dollars, the Nation's output of all goods and services this spring will probably add up to about \$365 billion on an annual basis, well above last year's \$356 billion. If these projections prove out, business activity will be well above 1954 and pushing toward the 1953 record.

Heavy industry will make some of the most significant production gains, and contribute substantially to the increased national product. Here are the forecasts:

Steel output is increasing. During the past year the industry turned out 88 million tons of ingots and castings. This year it will produce at least 96 million tons. Steel output at the higher 1955 level will call for blast furnace production of around 67 million tons of pig iron. Last year's total was 60 million tons.

Chemical companies will boost output 5% over last year. After leveling off in 1954, the industry will again resume its long term growth, featuring increased output of plastics, synthetic textiles and petro-chemicals. Petroleum refineries will up output because trucks will haul more freight, an estimated 2 million more cars will be on the road this year, and new homes will increase the need for heating fuels.

Output of the paper industry will be slightly higher overall, with paperboard stacking up the most substantial gains. Nonferrous metals, after a slump last year, will move along with the quickening pace of business.

All these heavy industries take a lot of **electric power,** and will be a major force behind a **5% increase in industrial purchases of electricity this year.**

On top of expanded industrial use, the electric utilities will take on 1.2 million new residential customers in 1955, and will substantially increase their sales to commercial establishments. Overall, power sales very probably will rise from 410 billion kw-hr last year to 438 billion kw-hr this year, or about 7%.

Other fields of business will show big gains in 1955. This may be the highest year on record for the construction industry. **New housing starts may again total around 1.2 million,** or about on par with last year. And state and local governments will undoubtedly push ahead programs for more schools, highways, and other public works.

Several of the consumer industries, too, will operate at higher levels. **Consumer purchasing power will hit an estimated \$292 billion by midyear.** Sales of processed foods and beverages will reach a new peak in 1955. And textile output may be up 6% over 1954, the first upturn since 1951. Apparel production may be up 4% this year.

The general business pick-up and particularly **the revival in heavy industrial production and electric power output** will lead to an expanded demand for industrial fuels in 1955. And there is an additional bright spot for the coal industry: industrial production in Europe is also picking up rapidly. **That means bigger exports.**

Looking ahead, the economic outlook this year contains an important element of strength for the long term. This may be the year that construction of new industrial plants, declining since mid-1953 turns up again. **New factories are the key to the long range demand for industrial fuels.**

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"THE YEAR 1954 HAS BEEN ONE OF TREMENDOUS ADJUSTMENTS IN COAL. THERE IS EVERY REASON TO BELIEVE THAT THIS HAS ABOUT REACHED A LEVELING OFF STAGE, AND THERE IS EVERY PROMISE THAT 1955 WILL BE A BETTER YEAR. THE IMPROVED ECONOMY OF THE COUNTRY WILL REFLECT ITSELF IN COAL. THE INDUSTRY HAS MADE TREMENDOUS STRIDES AND IT IS BELIEVED THAT FEDERAL AND STATE GOVERNMENT, CUSTOMER AND PUBLIC REALIZATION OF THE POSITION OF THE INDUSTRY WILL BE HELPFUL IN CRYSTALLIZING THE FACT THAT A STRONG, REASONABLY PROFITABLE INDUSTRY IS A MIGHTY BULWARK IN OUR ECONOMY IN TIMES OF PEACE AND WAR."=

L C CAMPBELL V P EASTERN GAS & FUEL ASSOCIATES=

How Coal Men See 1955

Bituminous: Up to 10% more tonnage and new opportunity to build

Anthracite: Lower tonnage but growing stability in output and sales

"I feel mildly optimistic"

In making a forecast of conditions in our industry in 1955, I feel mildly optimistic. We have analyzed our company's prospects for the coming year and foresee a tonnage increase measuring from 3% to 16% over 1954 totals. The extent of the increase depends somewhat upon internal conditions within our company rather than general conditions in the industry. A large share of our anticipated increase, however, will result from a shift in emphasis away

from areas of declining market activity to the expanding electric-utility field.

We feel the outlook for the Middle West is slightly less favorable than the prospects for eastern mines which will benefit directly from an enhanced metallurgical coal market.

We in the Middle West are faced with new supplies of low-cost natural gas which threaten to make further inroads in coal's existing markets, and we can ship even less coal to an ever-shrinking locomotive-fuel market. On

the plus side, however, the Middle- West segment of the industry should participate in a progressively larger utility market and, in its sales to industry, should benefit from the predicted modest increase in business activity.

We feel very strongly that the electrical utilities, now the major users of coal, are shortsightedly taking advantage of the buyers' market to hammer the price of coal to a ruinously low level, which will not permit the profit necessary to maintain a healthy coal industry. If this trend continues unchecked for another year, enough mines will be closed to reverse the downward spiral and, through the workings of supply and demand, bring about sharply increased coal prices.

**R. H. Sherwood, Chairman of the Board
Stonefort Corp., Indianapolis, Ind.**

"Possibly 10% higher than 1954"

Slightly more optimistic tonnagewise for 1955—possibly 10% higher volume than 1954. However, no improvement and probably further softening on price level, more mechanization of mines, closing of more high-cost or poorly-equipped mines, continued emphasis on good preparation of coal, and more mergers of operating and sales companies in 1955.

Improvement in volume will be due to higher production by industry now that industrial inventory liquidation has run its course and by some improvement in coal's important markets. Lack of improvement in price level due to continued highly competitive marketing conditions in coal-sales picture.

**R. C. Luther, Executive Vice President
Peerless Coal & Coke Co., Bluefield, W. Va.**

"Renewed industrial activity and new growth"

Industry outlook good for 1955. Expect definite improvement our own company. Anticipate 10 to 15% step-up because of renewed industrial activity and new growth in this area, with oil and gas prices moving up.

**N. D. Cortright, President
Hastings Fuel Co., Philadelphia, Pa.**

"About 415 million tons in 1955"

Present figures indicate that 1954 production of bituminous coal will be close to 390 million tons. Due to the improved outlook for steel production, probable increase in consumption of coal by electric power plants, together with the outlook for general improvement in business, I believe that production for 1955 will total about 415 million tons.

This company's production for the year 1954 was substantially curtailed due largely to the continued softening of prices. As a result of the post-war closing of a large number of marginal mines and substantial cutbacks by a large number of other companies I feel that prices might improve a little, at least somewhat more stabilized than during the past year. We expect to increase the output of our properties by at least 50% during the coming year.

I am still extremely critical of the purchasing policies of our government for coal for publicly-owned steam-electric plants and for export. The past and present policy to purchase coal from non-union operations by the government is the No. 1 problem to unionized mines. No doubt non-union production is increasing and will continue to be a problem until the Congress establishes minimum prices

for coal. Some operators will continue to object to government regulation of prices on the theory that there are too many ways to evade established prices. Granting there will be some evasions, there could not be enough to disrupt the market and demoralize the industry as the present non-union coal and unfair purchasing practices of government agencies have done.

**J. E. Bowman, President
Utilities Elkhorn Coal Co.,
Pikeville, Ky.**

"An upswing is starting"

In my opinion, the coal industry and our company will see modest business improvement in 1955. Various predicted economic forces are beginning to be felt and should result in a slight upturn this year. Unsatisfied domestic demand, decreasing availability and increasing prices of natural gas and fuel oil are partially responsible. Steady increase in demand for electric power with utilities in our area hitting new all-time highs at six-month intervals (heating and lighting in winter and summer air-conditioning) contributes to the trend along with population growth and industrial expansion. New power-plant construction is going forward. Heavy industry and public utilities are becoming more and more coal conscious.

More favorable freight rates are being negotiated with railroads co-operating. 1955 increase will be slight and certainly spotty by areas and companies, but the low point has been reached and an upswing is starting.

**K. A. Spencer, President
Pittsburg & Midway Coal Mining Co.,
Pittsburg, Kan.**

"Not much improvement in price"

Production already on the upturn—should continue during 1955. However, do not anticipate much improvement in price. With possible government assistance improvement might amount to as much as 10%.

**Whitney Warner Jr., President
Warner Collieries Co., Cleveland, Ohio.**

"More confidence and optimism"

With increased steel output approaching 100% of capacity, the outlook for 1955 in Alabama for an increased coal market is improved, but the total tonnage of deep-mined coal from our commercial operators will still probably not exceed 50% of the 1953 output.

The captive mine tonnage will be materially increased, also the requirements of the electric utilities for steam coal.

Our Alabama operators, greatly reduced in number, are, however, entering the new year with more confidence and optimism for a better year than 1954, and see more daylight ahead for the future of the Alabama coal-mining industry even under present adverse conditions.

**C. S. Blair, President
Black Diamond Coal Mining Co.,
Birmingham, Ala.**

"Can expect some increase"

Inventories are low, and if general business conditions continue to improve we believe the coal industry can expect some increase in production.

**Stuart Colnon, President
Freeman Coal Mining Corp., Chicago**

Anthracite in 1955: Tougher,

"Cost and flexibility"

We are encouraged by recent price increases that have held firm and we look for further improvement in price stability and realization. The new allocation plan, which provides greater flexibility than the original plan, should contribute to a firmer market in 1955.

In all likelihood the market for anthracite as a household fuel will continue to shrink. We expect, however, to strengthen our share of the market by aggressive selling and promotion. In this connection, we plan to intensify our marketing efforts behind the new and improved types of automatic furnace equipment which we began handling early in 1954 and with which we have had striking success.

Important as price realization and stability are to the future of the industry, it should be realized that the industry's major problem is one of costs, and that permanent progress will depend on the industry's ability to apply modern tools and techniques of production to the business of mining anthracite.

We plan to continue our capital improvement program with an investment of \$3-4 million over the next two years. We expect this investment in new and improved mining, breaker, and other facilities to contribute to further reductions in our costs and to greater flexibility in

the capacity output of our operations. This flexibility will permit us to key our operations directly to market opportunities and to produce between 3½- and 4½-million tons on an efficient and profitable basis.

F. O. Case, President

Glen Alden Coal Co., Wilkes-Barre, Pa.

"Problems less acute"

Anthracite enters 1955 as a tougher, leaner, harder industry than at probably any time in its history. It has achieved that condition because of the realization that it must produce more efficiently and sell more imaginatively than it has ever done before if it is to prosper and grow.

This realistic attitude has been brought to bear on the problems that have plagued anthracite these past several years. Such problems have included excess production facilities and unstable market conditions, complicated by the inroads of competitive fuels. While it is still too early to say that these problems have been solved satisfactorily, it is a fact that they are not as acute as they have been in the past two years.

The industry, which has been in an overproduced position for a number of years, is adjusting itself to meet today's market requirements. These changes in the number

"Operators must seek the buyers"

The outlook for the coal industry and our company in 1955 looks brighter than the past year, which measured to our expectations. We look forward to a greater volume of business, say an increase of about 10%, due to increased government buying, world needs, lower stocks of coal than last year, and last but not least, the phenomenal growth of the U. S. A.

The industry will continue to be confronted with the larger units swallowing up some of the weaker ones, the result being that buyers eventually will pay more as competition weakens and prices stabilize. We repeat, the operators must seek the buyers.

H. B. Salkeld, President

Tasa Coal Co., Pittsburgh, Pa.

"Contribute to research . . . support NCA"

Outlook for coal industry and our company is optimistic for 1955. Despite the fact output for 1954 is lowest in 17 yr, we are still enthusiastic about future. Production should we are still enthusiastic about future. Production should increase a little next year, not much. Our tonnage this year increased only 5%, but only as a sacrifice in reduction of prices to meet absolutely unwarranted price-cutting and competition. Sooner coal industry gets wise like other large corporations that they can only continue when operating at a profit the better off they will be.

We need legislation and protection against the importation of residual oil. We need proper legislation against unrestricted prices of natural gas and its transportation charges. The gas industry should be supervised in dumping its gas in the summer and selling it at high prices in the winter.

People who sell the gas at the wells should also be compensated sufficiently for their product. It also is a natural resource and should be conserved.

The coal industry needs the following:

1. Reduced wages and some control over the 40c per ton welfare fund, or it should be put in competent hands and regulated by actuaries.

2. It needs competent young mining engineers to go into the industry to help mine coal more cheaply.

3. Our greatest and crying need is for research and all companies should join in a program to contribute more for research which will be the salvation of our industry. Only a few cannot accomplish this; both large and small operators must contribute to research.

4. All coal operators should join and contribute to the National Coal Association which is fighting their battles in Washington.

5. There are too many competing coal associations, which should join together with National Coal in this battle, rather than try to win their small, ineffective approach.

Henry C. Woods, Chairman of the Board
Sahara Coal Co., Inc., Chicago, Ill.

"Naturally we are optimistic for 1955 . . .

. . . otherwise we would not be investing in a washing and cleaning plant."

R. S. Walker, President

Bradford Coal Co., Bigler, Pa.

"The bituminous coal industry had better take warning . . .

. . . from what has happened to the anthracite coal industry."

J. G. Bradley, President

*Elk River Coal & Lumber Co.,
Dundon, W. Va.*

leaner, harder . .

of producing units will assist in stabilizing the industry, and take it from a deficit position to a position of greater economic strength. This means that the outlook for anthracite in 1955 is improving. And should this improvement continue throughout the year the industry will enjoy a satisfactory return.

Perhaps one of the outstanding features in the industry presently is the feeling of renewed confidence. Producers and dealers alike are beginning to realize once more that despite the decline in tonnage, anthracite is still a substantial business. The industry is doing between \$350- and \$400-million worth of business a year. It is turning out the best product in its more than century-old history.

Modern merchandising and selling methods are making the consuming public cognizant of the quality of the product. Moreover, the natural superiority of anthracite as a fuel of high carbon content and inherent steady burning characteristics has been considerably enhanced by the extensive development of automatic heating equipment. Today, the widest variety of these units make available automatic anthracite to consumers at low cost. In fact, automatic anthracite from a competitive standpoint is lower in cost than any other automatic heat. It is even lower than heat from hand-operated systems.

Meanwhile, the industry continues to make good strides

towards its goal of expanding its industrial fuel market. The Philadelphia & Reading Coal & Iron Co., for example, now is supplying nearly a score of industries a tonnage that amounts to nearly 40% of its entire output. Our progress in the industrial market in recent years offers a sound warrant for the conviction that the industry can steadily broaden its use in these areas.

For the longer term, new non-fuel uses for anthracite are being pursued. In recent years the industry has had underway a long-range experimental and research program. Its objective is to develop broader uses and ultimately to conserve anthracite. In this direction lies anthracite's greatest potential. National, state and privately-owned research agencies are co-operating in the attainment of this goal. In addition, Philadelphia & Reading has launched on its own initiative a number of research projects. While it is much too early to appraise with any degree of accuracy the ultimate value of all this work, there is sufficient indication at present to warrant its continued aggressive promotion.

While many problems still confront the industry, none is impossible of solution, and most are of the type that have been solved in other industries. It is my conviction that anthracite, likewise, will solve its problems and in doing so, the possibilities of the industry will be more fully realized than ever before.

Edward G. Fox, President

Philadelphia & Reading Coal & Iron Co.
Philadelphia, Pa.

"If realization improves, better year ahead"

Anticipated improvement in steel and other heavy industry as well as improved prospects for export should result in substantial increase in this year's bituminous production.

If realization improves in proportion to anticipated tonnage increase the coming year should be definitely better than last.

S. B. Johnson, President

Lorain Coal & Dock Co., Columbus, Ohio

"Fundamental reasons for optimism"

Statistics, I fully appreciate, may not seem to stimulate much enthusiasm in the industry, yet upon careful analysis I believe there are some fundamental reasons for real optimism.

Fully recognizing that coal production has dropped to an alarming low, that residual oil continues to flow in and no relief appears in prospect, and that the extension of natural-gas lines and importation of gas from Canada is an immediate threat, especially in the West, it may seem that one is "whistling in the dark" in attempting to build an optimistic picture of coal's future. I believe, however, there are other factors to be considered, making the above detrimental factors less ominous to the progressive coal producer. A few of these factors are:

1. It is not unreasonable to believe that the next 10 yr will see an increasing demand for energy, even greater than that experienced over the past 10 yr. This demand could be as much as 50% above our present demand, and this obviously would absorb a vast amount of oil and gas now plaguing the coal industry.

2. To supply the increased energy demand over the past 10 yr, particularly out here in the West, numerous

hydroelectric installations, like Hungry Horse, McNary, Bonneville and Grand Coulee dams, now are operating. These have to a great measure absorbed most of the potential water power in the West. Therefore, any increasing demand for energy must be met with steam-plant installations.

3. The fuels called upon to energize these steam plants, whether oil, gas or coal, will be determined largely on a basis of unit cost.

In relation to unit costs, my observations have convinced me that both oil and gas, for natural reasons, will increase much faster than coal.

As to the picture for coal, it must be remembered that many coal mines were opened to meet the war emergency, which under normal conditions would obviously be uneconomic. Many high-cost mines must close in favor of lower-cost mines, which are low-cost mines because of their market availability plus a high degree of mechanization.

In recognition of this, our company has closed three mines over the past 15 yr. Our present operation is highly mechanized, and in view of our competitive position we feel justified in expressions of optimism for the future of our own company, and we further believe the overall picture for the industry should by no means be frightening to anyone with invested capital under those conditions.

We anticipate spending a considerable amount of money in expansion and further mechanization in 1955, and we are confident it will insure an adequate return on the investment.

In conclusion, may I quote an axiom of chess: "A defensive game is a losing game." Our motto is to also follow this axiom in business. We find it pays to stay on the offensive or to quickly liquidate a property with a questionable future.

A. B. Foulger, Vice President and General Manager
Lion Coal Corp., Ogden, Utah

How the Top 15 Coal-Producing Groups Ranked in 1954

Compiled by Keystone Coal Buyers' Manual, a Coal Age Affiliate

Group or Company	1954	% Change	1953	% Change	Standing			
	Tonnage	1953 to 1954	Tonnage	1952 to 1953	1954	1953	1952	1941
Pittsburgh Consolidation.....	22,916,792	-15.8	27,209,616	+5.9	1	1	1	..†
U. S. Steel*.....	22,677,697	-12.9	26,048,037	+35.4	2	2	2	1
Sinclair-Southern Coal Groups*...	8,320,690	-5.0	8,761,838	-1.3	3	7	5	29
Eastern Gas & Fuel.....	8,138,375	-14.2	9,483,431	-14.2	4	5	3	2
Island Creek-Pond Creek*.....	8,079,524	-9.0	8,879,428	+3.0	5	6	6	5
Bethlehem Steel.....	8,068,600	-17.5	9,780,915	+27.0	6	4	9	8
Truax-Traer*.....	7,203,610	-9.3	7,937,672	-0.5	7	9	8	17
Peabody Coal.....	6,999,976	-29.5	9,929,158	+7.2	8	3	4	3
Pittston Group.....	6,499,633	-24.0	8,557,140	+6.4	9	8	7	..†
Pocahontas Fuel*.....	6,122,078	+3.0	5,937,270	-3.5	10	11	10	10
Jones & Laughlin Steel*.....	4,892,317	-10.3	5,457,351	+20.4	11	12	18	14
Glen Alden*.....	4,652,547	+21.7	3,821,895	-36.7	12	17	11	7
Berwind-White.....	4,418,572	-16.4	5,288,223	-11.1	13	13	12	9
North American Group*.....	3,836,559	-13.9	4,459,762	-9.1	14	14	14	37
Philadelphia & Reading*.....	3,742,309	-6.6	4,008,765	-22.5	15	16	13	12
Total.....	126,569,179	-13.6	146,550,731					

*Percentage change, 1953-54, better than national average of 14.1% loss. †Before merger.

COLLECTIVELY, the industry's 15 top producing organizations in 1954 mined 30.2% of the total anthracite and bituminous produced. Their 1954 tonnages totaled 13.6% below 1953, compared with a loss of 14.1% for the coal industry as a whole. Output of the 15 ranking groups in

1953, all bituminous, totaled 148,625,725 tons, or 33% of the year's bituminous production. Two anthracite companies, returned to the list in 1954 after a year's absence, Glen Alden with 17.2% of the anthracite total and P&R with 13.8% of the industry's 1954 output.

"Do not expect any improvement"

I do not expect any improvement in our coal industry in 1955 unless you can call the leveling-off process at the bottom an improvement. Although industrial business as a whole should improve, it will not be reflected in the coal industry until we have some help from the federal government through restriction of oil imports, revision of coal-purchasing methods of the government and/or a minimum price law, and I do not see any help from Congress or the administration on any of the above items in 1955.

Findlay H. Davis, President
Old King Mining Co., Cincinnati, Ohio

"Slight prospect in the West"

It is my opinion that there is but slight prospect of improvement in the western coal industry for 1955 over 1954. Encroachment by non-union mines continues; certain western railroads, through subterfuge or otherwise, continue to violate the commodities clause of the Interstate Commerce Act; and there is prospect of increased natural-gas competition generally. However, nationally I believe some modest improvement may be anticipated. The industry is more commonly united than ever before in its history and, through the vigorous effort of able appointed spokesmen, constructive changes in the buying policies of the government appear probable, both for American and foreign consumption.

The apparent awareness of the Administration to the fact that both the manpower and the productive capacity of the industry have decreased to dangerous levels from the defensive viewpoint should afford administrative support for the above, as well as enactment of favorable legislation. It appears that the industry has reached the low ebb of its current business cycle.

P. L. Shields, President
Spring Canyon Coal Co.,
Salt Lake City, Utah

"Last summer most difficult"

Our business is predominantly metallurgical and special-purpose coal and our record for 1955 depends upon the market for such coal. Because of transportation disadvantages and unfavorable natural mining conditions we are not helped by improvement in demand for industrial coal. We believe the past summer was our most difficult period and that some slight improvement is evident for 1955.

C. D. Reed, President
Turner Elkhorn Mining Co., Drift, Ky.

"Low-cost, high-quality operations will prosper"

We look to 1955 with confidence. We interpret the downward trend in coal prices during the last few years as an indication of the success of the industry's mine mechanization program. This price reduction coupled with a general improvement in product quality has strengthened coal competitively. Internally, the competition will remain quite keen. Low-cost, high-quality operations will continue to prosper and enlarge their proportion of the available market.

F. E. Williams Jr., Secretary-Treas.
Pecks Run Coal Co., Buckhannon, W. Va.

"Optimistic for lignite"

Our company optimistic regarding outlook for coming year in our field, lignite. Sales past year approximately same as past 3 or 4 yr, slight decrease in domestic sales while power contracts have increased. Expect this trend to continue. Expect heavy competition from natural gas in North Dakota in future, but think we can hold our own in power industry under present price situation. No comment on rest of coal industry as others better qualified to speak.

W. A. Porter, Vice President
Dakota Collieries Co., Minneapolis

"Somewhat improved"

Considerable publicity has been given the so-called "sick" coal industry, and during the past two or three years it has had numerous problems. Competition within the industry, importation of foreign oil, and dump gas have given coal producers considerable trouble. Also, the tremendous loss of tonnage to the railroads has been a factor controlling a considerable portion of the national production.

It would appear that the loss of production because of these things has reached its limit. Most railroads have completed their dieselization program as far as they intend to go. It is apparent that with storage domes in the gas industry, increases in well-head price, and other situations, coal will reclaim a large part of the business now being supplied by so-called "dump gas."

It is difficult to predict what will happen on the importation of residual oil that is displacing coal to a large extent. However, this should not get any worse than it has been in recent years. The public-utility use of coal will continue to increase, and I think the overall picture for the coal industry in 1955 is somewhat improved over the past 3 yr. I predict an increase in national production of approximately 10%, with possibly some improvement in the average price returned to the producer.

1955, to me, has a somewhat improved outlook over recent years.

Frank F. Kolbe, President
United Electric Coal Cos., Chicago

"A little help"

We expect some increase in the new year over last year and it could be if the government would give us a little help, and I am sure they could.

Richard T. Todhunter Sr., President
Barnes & Tucker Co., Barnesboro, Pa.

"Break the 400-million ton mark"

The coal industry should have an excellent opportunity to break the 400-million ton mark in 1955 given continued general business improvement as shown in recent weeks. This should be reflected in steady and substantial steel production and all-around industrial activity. The utilities continue to be the bright spot.

The industry is still at the post in the following:

1. Developing consolidations and sound marketing program through marketing agencies.
2. Developing realistic program in its labor relations.

William H. Cooke, President
Little Sister Coal Corp., Chicago

"Exceed 1954 by a nice margin"

1955 coal production should exceed 1954 by a nice margin and we expect a steady annual increase in future years.

The industry must install improved mining methods to secure lower production costs; also, fight for lower transportation rates to enable it to meet competition of residual oil and gas.

J. G. Kidwell, President
Haywood Coal Co., Fairmont, W. Va.

"If the industry gets its share"

With all signs pointing toward increased production in electric power, steel and other industrials, bituminous

coal production should increase 5 to 10% in 1955 over 1954, if the industry gets its share of this anticipated improvement in business.

J. William Wetter, President
Rockhill Coal Co., Philadelphia

"Carriers beginning to realize"

We and our associated companies are optimistic about 1955. The future of the industry depends upon low-cost production and this seems to be recognized by many in view of recent consolidations and the abandonment of a number of high-cost mines.

Adjustment of present freight rates by railroads to make coal competitive with oil and gas will help and I feel the carriers are beginning to realize this. River transportation will play a large part in the future, and we believe this so much that Potter Towing Co., one of our affiliates, has just placed an order for another 3,200-hp towboat and more jumbo barges to supplement its present fleet.

The coal industry can survive if cost of production is reduced by careful management and sales are increased by aggressive salesmanship. I believe it will.

Justin Potter, President
Nashville Coal Co., Nashville, Tenn.

"Substantial expenditures"

Industry generally is showing its confidence in business improvement by authorizing substantial expenditures for betterments and expansion. Believe 1955 should be better than 1954.

John E. Evans Sr., President
Pine Township Coal Co., Inc.
Pittsburgh, Pa.

"If steel continues to increase"

If the steel industry continues to increase along with other industries which seem to be on the mend, I can't help but feel that some place along the line it will benefit the coal man, even though the coal industry at the present time does not show much improvement.

George H. Bortz, President
Bortz Coal Co., Uniontown, Pa.

"Increased sales efforts"

We expect some improvement in our production during 1955 through increased sales efforts to retard loss of business to gas, oil and non-union mines. Coal mines producing coal largely for industrial and power-plant use should enjoy appreciable increase.

Joseph H. Schneider, Chairman of the Board
Dawson Daylight Collieries Co.
Dawson Springs, Ky.

"Cut costs . . . maintain prices"

The responsible people in our industry must continue to use every means at their command to effectively lower costs to improve our product and to eliminate unwarranted price reductions. If we do these things, I believe we have passed the low point and optimistically look for improvement in 1955.

Richard Baldwin, President
Midwest-Radiant Corp., St. Louis, Mo.



EFFORTS TO IMPROVE INTERMEDIATE TRANSPORTATION In continuous-mining systems led to development of extensible conveyors and bridge units.

Mining, Stripping and Cleaning

Deep Mining

1954 GOES DOWN IN THE BOOK as a year in which deep mines applied every conceivable lever to the job of sending lower-cost raw coal into the cleaning plant or over the loading

ramp. Among the most effective were the following:

1. Production effort within companies was concentrated in only the most efficient properties owned, and within individual mines to fewer production sections—mechanized to the hilt.

2. Continuous mining was more

widely adopted, and the process was accelerated by development of extensible, articulated and bridge conveyors to the point where they promised solutions to many intermediate-transportation problems.

3. At mines where natural conditions, market factors or other considerations demanded the use of conventional mining methods, the accent was on time-and-method scrutiny of every detail of operations, with reports from the field showing that it was usually possible to discover some fat for removal.

4. Useful new equipment, designed to reduce the costs of servicing the primary face functions, caught the eye of the industry and was worked into mining cycles to marked advantage.

5. Mine layout in other instances was changed to get more good out of existing equipment or to permit the use of newer, better units in compatible workings.

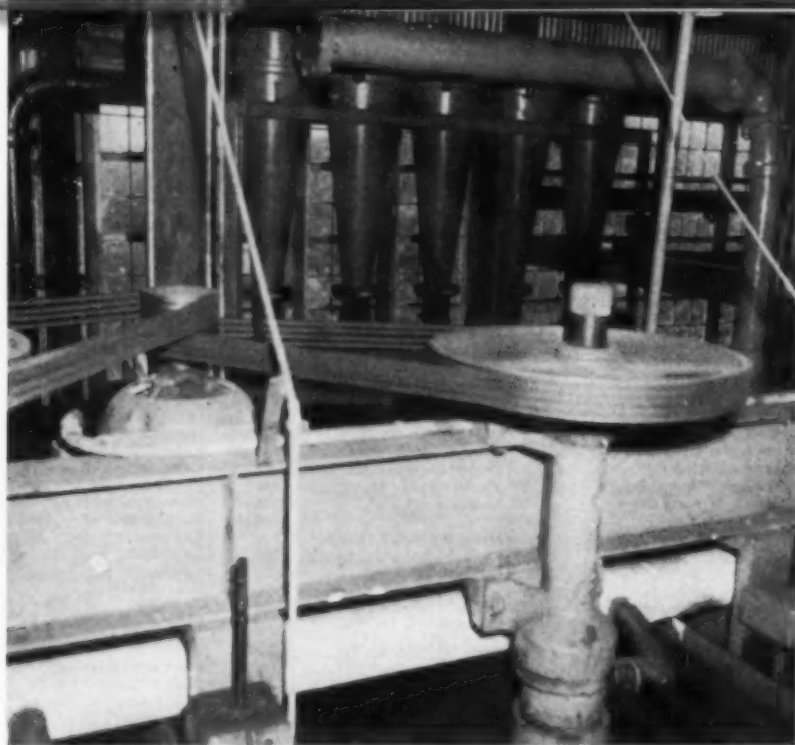
Here are some examples of how such levers were employed:

CONCENTRATION: An Effective Belt-Tightener . . .

Total mine production of 4,000 tpd is recovered almost entirely from one panel at a mine in southwestern Pennsylvania. Twelve production units



PLANNED MAINTENANCE and improved overburden preparation helped strip-mine operators control costs in 1954.



NEW COMBINATIONS of conventional units contributed to cleaning economy and efficiency by permitting the use of compact circuits.

Developments

equipped with vibrating-hammer-type continuous miners, are in operation, two in development of butt entries, four in driving rooms and six in re-treating room pillars in panels 4,000 ft long with room 1,020 ft long. Each unit requires a four-man face crew.

Similar planning is evident at the newest large mines in Illinois, where concentration within definite areas promotes faster extraction, better utilization of belt conveyors, improved roof control and simplified ventilation. Furthermore, service manpower is held to a minimum as the number of producing areas is reduced.

In anthracite, continuous-mining machines, loading machines and rubber-tired and tracklaying shuttle cars were at work underground in efforts to achieve some of the benefits of concentrated operations. Several companies near the end of the year were moving conveyors and duckbills out of mothballs and into the workings to get similar results under conditions which require conveyor methods. And the grapevine had it that one company was energetically working a steeply-pitching vein by induced-caving methods.

CONTINUOUS MINING: Big, and Growing Bigger . . .

It is estimated that at the end of 1954 there were 320 continuous-min-

ing machines of all types sold or already in operation. Units with ripping or boring heads predominated, but the industry showed increasing interest in the cutting-vibrating type and in a machine which cuts a circular-arc rib, thus solving some roof problems. In Kentucky, early reports were released telling of a productivity of as much as 47 tons per man-day from a 42-in seam, using a two-man crew to operate a shuttle car and a loading machine with a continuous-mining head attached. The conversion unit consists of two rotary heads on oscillating arms.

But the big news in 1954 was the development of improved transportation backing up the mining machines. The extensible belt conveyor, taking coal directly from the advancing miner and discharging at a fixed point, proved that it might be possible to (1) favorably adjust the ratio between development work and room work to reduce total mine costs per ton, and (2) substantially increase the productive time of the high-capacity mining machines.

The use of articulated conveyors permitted one operator to apply successfully a boring-type machine to recovery under the highwall, advancing 16 in per min in openings 9½ ft wide up to 350 ft long or more. From 36 to 46 in of height is mined and recovery is about 70% of the coal in place. The same company now has another unit

with an extensible belt backing up the continuous machine for drives perhaps 1,000 ft long. Development of bridge-conveyor equipment and methods designed to promote high efficiency in adapting continuous miners to wider work, using conveyors for room and gathering transportation, was the object of increased attention in 1954.

Also evident in 1954 was a determination on the part of producers to achieve fuller realization of the ultimate potential capacity of the continuous machines under prevailing natural conditions at their own mines. The design of cutting heads, including bits, bit blocks and core breakers, was closely studied at a number of mines to find the best combination for producing at a high rate in satisfactory size consist. A number of machines were repowered where tougher seams demanded such recourse, and at one Kentucky mine the life of cutting chains was materially increased by eliminating the wearing strips on the underside of the cutting head.

CONVENTIONAL MINING: How Some Producers Found the Payoff . . .

As noted, not all producers found a prayerful maiden's answer in continuous mining. For good and compelling reasons some chose to stick with more prosaic methods, and found to their delight that an investment of thought, energy and money still can pay off handsomely in conventional mining, too.

The coal division of a large steel company realized a 10% increase in man-shift face output, for example, by changing to hand-held hydraulic coal drills in sections worked by track-mounted equipment in southwestern Pennsylvania. Worthwhile savings in mine-car maintenance costs were made at a Kentucky mine by building the cars out of structural-steel shapes rather than plates. The sides of the cars are 18-in channels, for instance. And at the same mine, higher efficiency was achieved by full-seam mining of two benches and a thick parting between them. The original plans called for mining only the bottom bench and supporting the rock binder, but further study showed that a better job could be done by taking the full seam, gobbing as much as possible at the face and adding cleaning facilities to remove the remainder of the rock.

An Illinois company improved its raw product by providing rotating lump breakers on all loading machines to eliminate later stages of crushing. Rubber-tired work benches which could be hauled into active sections

were instrumental in reducing mechanical delays, and powered belt winders in other mines helped speed up conveyor moves.

In a 30- to 36-in seam in eastern Kentucky, face crews averaged 25 tpm using loading machines with bridge and chain conveyors. A loop system of handling mine cars at the loading point contributed to this high productivity. Another company, using off-track equipment, saved \$30,000 in 2 yr in roof-control costs after proving that wood pins were as effective as bolts in holding the roof in short-lived rooms.

Still other developments showed how greater efficiency in conventional mining could be achieved. The work of constructing ventilation installations was speeded through the use of spad drivers for hanging curtains, and by plywood and metal stoppings and prefabricated overcasts. Rock-dusting from shuttle cars reduced labor costs in this service. Precast concrete sections permitted rapid lining of a shaft, and automatic battery chargers reduced human effort and chances of error.

A new 300-kw selenium rectifier showed up in the field and a glass-bulb rectifier worked out to advantage.

Face preparation was improved as more producers searched out the best possible bits for their own conditions, and an increase in the number of air- and chemical-breaking installations was noticeable.

As the year closed, the conventional-mining faction of the industry was a beehive of activity in studying all elements of operations.

NEW EQUIPMENT: Helpful Aids To Lower Operating Costs . . .

Past years have seen the advent of cutting machines, shearing machines, planing machines and stripping machines, among others, but the word from overseas has it that the 1954 entry is a coal-peeling machine, with operating reports yet to come. The indication is that equipment development is not stagnant. In 1954, new types of loading machines and continuous-mining machines rumbled out of assembly plants and into their shakedown trials. One manufacturer announced encouraging sales of a rugged shuttle car.

High-speed, high-pressure roof drills took their places in the mines and dry dust collectors were tried with others reported far along in development.

Loudspeaking mine telephones were installed at one mine to enhance rapid communications. Palletized sup-

New Bituminous Preparation Facilities in 1954*

Coal Company	Plant Location	Capacity, TPH	Preparation Equipment
Alabama By-Products Corp.	Maxine, Ala.	300	Western Machinery ¹
American Coal Co. of Allegheny County	Deerfield, W. Va. (2)	144	Roberts & Schaefer ¹
Amherst Coal Co.	Rensford, W. Va.	55	Heyl & Patterson ¹¹
B. H. Swaney, Inc.	Walkover, W. Va.	175	Roberts & Schaefer ¹
Blue Diamond Coal Co.	Leatherwood, Ky.	80	Deister Concentrator ¹
Bradford Coal Co.	Bigler, Pa.	150	Daniels ¹
Buchanan County Coal Co.	Big Rock, Va.	220	Jeffrey ¹
Carbon Fuel Co.	Carbon, W. Va.	3	Fairmont ¹
Christopher Coal Co.	Pursglove, W. Va.	450	Dorr-Oliver ²
Clinchfield Coal Corp.	Fremont, Va.	12	Fairmont ¹
Coal River Mining Co.	Hookersville, W. Va.	200	Deister Concentrator ¹
Coltman Mining Co.	Madisonville, Ky.	365	Fuel Process ¹²
Compass Coal Co.	Dela, W. Va.	80	McNally Pittsburgh ¹¹
		300	Deister Concentrator ¹
	Phillippi, W. Va.	100	Fairmont ¹²
		16	Link-Belt ¹²
Crichton Coal & Coke Co.	Johnstown, Pa.	120	Fairmont ¹²
Davis & Adkins Sand Co.	Ferrelsburg, W. Va.	10	Dorr-Oliver ²
Dawson Collieries Co.	Dawson Springs, Ky.	5	Daniels ¹
Dawson Daylight Coal Co.	Dawson Springs, Ky.	5	Deister Concentrator ¹
Drydock Coal Co.	Nelsonville, Ohio	150	Heyl & Patterson ¹²
Eastern Gas & Fuel Associates	No. 1, Wharten, W. Va.	400	Fuel Process ¹²
	No. 2, Wharten, W. Va.		Ind. Engrg. & Const. ¹
Emerald Coal & Coke Co.	Clarksburg, Pa.		Kanawha ¹²
Enes Coal Mining Co.	Oakland City, Ind. (2)	285	Kanawha ¹²
Freebrook Corp.	Timblin, Pa.	15	Heyl & Patterson ¹²
	Marion, Ill.	128	Link-Belt ¹²
		488	Roberts & Schaefer ²⁰
Freeman Coal Mining Corp.	Johnston City, Ill.	210	Jeffrey ¹²
Green Coal Co.	Owensboro, Ky.	16	Dorr-Oliver ²²
Greer-Clintwood Coal Co.	Clintwood, Va.	200	Fuel Process ¹²
Gulf Mining Co.	Maben, W. Va.	50	McNally Pittsburgh ¹²
Guyan Eagle Coal Co.	Kelly, W. Va.	60	Kanawha ¹²
Harlan Collieries Co.	Brookside, Ky.	350	McNally Pittsburgh ¹¹
Hopkins County Coal Co.	Madisonville, Ky.	50	Roberts & Schaefer ²
	Hostetter, Pa. (16)	15	Heyl & Patterson ¹²
Jamison Coal & Coke Co.	Farmington, W. Va.	160	Deister Concentrator ¹
			Ind. Engrg. & Const. ¹²
			Deister Concentrator ¹
			Peterson Filters ¹²
Joanne Coal Co.	Rachel, W. Va.	350	Link-Belt ¹²
		150	Heyl & Patterson ¹²
Johnstown Coal & Coke Co.	Panther Gulch, W. Va.	180	Fuel Process ²⁰
Jones & Laughlin Steel Corp.	LaBelle, Pa.	12	Deister Concentrator ¹
Kaiser Steel Corp.	Sunnyside, Utah	63	McNally Pittsburgh ¹²
Kentucky Cardinal Coal Corp.	Cardinal, Ky.	85	Denver Equipment ¹²
Marco Coal Co.	Apollo, Pa.	150	Roberts & Schaefer ¹²
Merrill Coal Co.	Big Creek, W. Va.	160	Daniels ¹
Midwest Utilities Coal Co.	Sparta, Ill.	75	Kanawha ¹²
Mount Hope Coal Co.	Mount Hope, W. Va.	300	Link-Belt ¹²
Panther Coal Co. of W. Va.	Bluefield, W. Va. (2)	500	Daniels ¹
Peerless Coal & Coke Co.	Vivian, W. Va.	320	Daniels ¹
Pine Township Coal Co., Inc.	Heilwood, Pa.	10	Nelson L. Davis ¹²
Pocahontas Fuel Co., Inc.	Bishop, W. Va.	10	Ind. Engrg. & Const. ¹²
Powhatan Mining Co.	Powhatan Point, Ohio	250	Deister Concentrator ¹
	Ault, Ohio	460	Jeffrey ¹²
Preston Mining Co.	Van Sant, Va.	200	Jeffrey ¹²
Red Parrot Coal Co.	Prenter, W. Va.	300	Link-Belt ¹²
	Keith, W. Va.		Kanawha ¹²
			Kanawha ¹²
Reppert Fairmont Coal Co.	Buckhannon, W. Va.	150	Roberts & Schaefer ¹
Republic Steel Corp.	Van Meter, Pa.	75	Heyl & Patterson ¹²
Richwood Sewell Coal Co.	Summersville, W. Va.	60	Deister Concentrator ¹
Ridgeview Coal Co.	Ridgeview, W. Va.		Kanawha ¹²
Royalty Smokeless Coal Co.	Landisburg, W. Va.	120	Link-Belt ¹²
		350	Jeffrey ¹²

ply-handling was a boon to others. Still others derived gratifying assists from auxiliary exhaust fans in face areas and from wet rock-dusting done on-shift.

Lightweight pipe and fast-action couplings were adopted in a number of places to promote lower-cost drainage. Low-height track-cleaning ma-

chines offered another possible boost in over-all efficiency in thin-seam operations, and even dual-purpose cars, for track or off-track operation, were offered for operators of small mines.

"Wheelbarrow" pumps, lock-in cutting bits, new methane detectors, faster timber jacks, new cable-splicing tools and better belt-repair tools and,

New Bituminous Preparation Facilities in 1954*

Coal Company	Plant Location	Capacity, TPH	Preparation Equipment
Russell Fork Coal Co.	Elkhorn City, Ky.		Kanawha ⁽¹⁾
S. A. Coal Corp.	Coalmont, Ind.	150	Fuel Process ⁽¹⁾
Saxman Coal & Coke Co.	Que Creek, Pa.	90	Fuel Process ⁽¹⁾
Seano Mining Co.	Saltsburg, Pa.	250	Daniels ⁽¹⁾
Splash Dam Coal Corp.	Splashdam, Va.	150	Daniels ⁽¹⁾
Stewart Coal & Coke Co.	Whitney, Pa.	35	Peterson Filters ⁽¹⁾
Stonefort Corp.	Stonefort, Ill.	10	Heyl & Patterson ⁽¹⁾
Stonega Coke & Coal Co.	Big Stone Gap, Va.	40	Heyl & Patterson ⁽¹⁾
Sunnyhill Coal Co.	New Lexington, Ohio	75	Heyl & Patterson ⁽¹⁾
Ten-X Coal Co.	Roseville, Ohio	150	McNally Pittsburg ⁽¹⁾
Tiega Coal Corp.	Tiega, W. Va.	65 (1)	Roberts & Schaefer ⁽¹⁾
Uniontown Coal Co.	Uniontown, Ky. (4)	30	Deister Machine ⁽¹⁾
	Corbin, Ky.	600	Link-Belt ⁽¹⁾
	Greensboro, Pa. (2)	300	Link-Belt ⁽¹⁾
	Ream, W. Va.	800	Kanawha ⁽¹⁾
United States Steel Corp.			McNally Pittsburg ⁽¹⁾
Usibelli Coal Mines, Inc.	Suntrana, Alaska	125	Kanawha ⁽¹⁾
Valley Camp Coal Co.	Shrewsbury, W. Va.		Kanawha ⁽¹⁾
	Ward, W. Va.		K. Prins ⁽¹⁾
Waterloo Coal Co., Inc.	Oak Hill, Ohio	100	Heyl & Patterson ⁽¹⁾
Westmoreland Coal Co.	Hutchinson, Pa.	80	Deister Concentrator ⁽¹⁾
Williams Coal Co.	Mannington, Ky.	5	Heyl & Patterson ⁽¹⁾

*Includes contracts for installations of new preparation equipment in existing structures. Where more than one equipment item was installed, the number, when known, is in parentheses after the plant address.

1. Wemco Mobil-Mill including 18-ft cone separator. 2. Super-Airflow cleaners. 3. Hydro-Separator for 5x $\frac{1}{2}$ and Super-Airflow for 3 $\frac{1}{2}$ x0. 4. Including SuperDuty Diagonal-Deck tables and Conceno revolving feed distributor. 5. Complete Daniels DMS dense-media washer, including design.

6. Including a 140-tph No. 200 unit washery with 5x14 twin-deck American Pneumatic separators. 7. 50-ft heavy-duty thickener. 8. Facilities to crush R-O-M to minus 5 in. 9. Conceno revolving feed distributor. 10. Complete Belknap calcium-chloride washing system.

11. Including McNally Norton washbox. 12. Including SuperDuty Diagonal-Deck tables and Conceno revolving feed distributor, refuse dewatering and desanding screens, and Multi-Louvre heat drier. 13. Refuse dewatering and desanding screens. 14. SuperDuty Diagonal-Deck tables. 15. Primary and middlings Belknap washers with auxiliary equipment.

16. Dumping and loading facilities including hopper, feeder, crusher, conveyor and 2-track loading. 17. Two-stage automatic sampling system, including Galicher primary and secondary samplers, electric feeder, sample crusher and conveyor. 18. Crushing facilities. 19. Multi-Louvre heat drier. 20. Separate Dutch State Mines heavy-media systems for 248 tph of 7x1 and for 140 tph of 1x $\frac{1}{4}$. and two Super-Airflow cleaners for 100 tph of $\frac{1}{4}$ x0, with Jeffrey jig for retreating rejects.

21. Two-compartment, 5-cell Jeffrey Baum jig. 22. 20-ft heavy-duty thickener for magnetite. 23. Including 160-in angle duplex Belknap washer with dewatering, desludging and recovery system and conveyors. 24. McNally Pittsburg Dryclone. 25. Fine-coal recovery and water-clarification system, including CMI Clust-R-Clone and dewatering screen, also CMI centrifugal drier for 1 $\frac{1}{2}$ x0.

26. Plant addition, including 16 SuperDuty

Diagonal-Deck tables. 27. Including four Symons V-screens, four Peterson TFR filters, Peterson Roto-Disc thickener and a Peterson disc filter. 28. Complete coal-preparation plant. 29. Addition to Belknap washing facilities, including washer and auxiliary equipment. 30. Denver Sub-A cleaning equipment for $\frac{1}{2}$ mmx0.

31. Hydro-Separator. 32. Complete 3-track tippie including slope belt from bin, primary vibrating screen, picking table, Gundlach crusher and car-loading and handling facilities. 33. Including Nelco submerged-feed heavy-media assembly, vibrators, raw-coal conveyor and rotary breaker. 34. Conveying and crushing equipment. 35. Baum-type jig.

36. Including coal crusher, ear shake-out and facilities to handle both rail and truck coal. 37. Coal-crushing facilities. 38. Including CMI Clust-R-Clone and dewatering screens for fine-coal recovery and water clarification. 39. Including 3-compartment, 8-cell Jeffrey jig and Multi-Louvre heat drier. 40. Conveyor system for automatic sampling.

41. Includes Symons V-screen and Peterson TFR filter. 42. Including McNally Norton washbox for 100 tph, 5x0, and McNally Pittsburg Dryclone for 50 tph, $\frac{1}{4}$ x0. 43. Deister Machine coal-washing tables. 44. Paddle mixer. 45. Float-sink concentrators.

46. Complete mine-run tippie. 47. McNally Tromp washer. 48. Installation of Farval automatic lubrication and dust-collecting system using 24,000-cfm American Air Filter Roto-clone. 49. New mine-run loading tippie with belt conveyor to rail-loading point. 50. Complete tippie and cleaning plant, including Prins unit washer and auxiliary equipment.

51. Reinveld fine-coal drier and accessories. 52. Cyclones, slurry pump and vibrating screen. 53. Water-clarification equipment, including eight manifolds of 3-in cyclones to close system. 54. Three 14-in cyclones and Reinveld drier and accessories. 55. Complete fine-coal plant, including two Reinveld driers, vacuum filter and accessories, vibrating screen and five 14-in cyclones.

for highest efficiency, then to follow through with intelligent planning for all mine services. Good examples of this modern planning are operating in Illinois and Colorado, both fully described in the issues of *Coal Age* for September and October, 1954, respectively.

Older mines, too, may have a new look. A case in point is the switch in operations at a large Utah property, where a 13-ft seam previously was mined by taking a 9-ft bench at the bottom then taking the top coal. Breaking of the top coal complicated life, sometimes to the point of forcing the abandonment of sections. But with roof-bolting showing a way out, officials of the company converted to a system of development and partial pillar in the top coal first and bolting the roof, then recovering the bottom coal either with off-track equipment or with scraper hoists. Recovery is up and costs are down.

Strip Mining

Strip mining continued to hold its position in the bituminous industry while increasing its share of production of anthracite. Application of large shovels with dippers up to 45-yd capacity continued to grow as coal companies geared to tackle thicker and tougher overburden while increasing stripping efficiency. Draglines shared the spotlight, particularly in steeply pitching anthracite seams. Bulldozers and tractor-drawn scrapers continue to perform yeoman service as utility units and in supplementing draglines and shovels where overburden had to be rehandled. Multiple-seam simultaneous stripping marked up new gains as operators strove to recover thin seams economically. Most of the bituminous output was recovered by contour stripping while anthracite open-pit work generally followed the pitch of the coal.

BETTER FRAGMENTATION: Key To Overburden Preparation . . .

Breaking overburden to permit easy handling by stripping units and at the same time not increase the drilling and shooting expense was the goal at most stripping operations. Better fragmentation was aimed not only at increasing stripper output but also at reducing maintenance costs and down time in the pit. Vertical dry-type rotary units continued to make gains in bituminous pits where overburden was thick or tough and became more widespread in anthracite stripping. Efforts also were exerted toward reducing vibration by application of delays and careful use

methods were other aids placed in use underground with the idea of saving pennies in full knowledge that consequently the dollars would save themselves. Late in the year, one manufacturer offered a "Brakeman" car, which adds braking capacity anywhere in a trip and is controlled from the cab of the locomotive.

MINE LAYOUT: A New Look Increases Efficiency . . .

The accent in 1954 was on wrinkled-brow planning before the first spadeful was turned for the new mine. Sleek new operations in all parts of the country showed an emphasis among planners to plot their recovery projections

of explosives. Sidewall drills continued to be favored where the overburden was comparatively light or did not lend itself to effective use of the vertical units.

BIG UNITS: Pacesetters In High-Capacity Stripping . . .

Application of a new 36-yd shovel along with matched loading and haulage units permitted an Ohio operation to eliminate four draglines and reduce stripping costs by 29%. Other benefits resulting from consolidation and concentration of work areas include a 20% increase in productive time for drill crews, an increase in hole spacing and an increase in yards of material broken per pound of explosive. A specially designed 26-yd shovel was put in service in Illinois to uncover two thin seams of coal from one position while working to a 65-ft highwall. The big unit works on top of the lower seam and removes a 50-ft strip of overburden from each of the seams as it advances into the shot bank.

Gains also continued to be made by draglines. A new-design 8-yd unit added 10 yr of life to a Pennsylvania stripping operation by working to an 80-ft highwall at no greater cost than a 4-yd drag working to a 53-ft bank. Other features of the drag include mounting on a single pair of crawlers, an alloy-steel lightweight tubular boom and a lightweight alloy-steel bucket.

Spoil area remained at a premium in the anthracite pits and spoil haulage therefore continued in a large scale. End-dump trucks and scrapers shared in this work. Bulldozers and scrapers also moved considerable overburden while teamed with draglines and shovels, and also saw additional service for land reclamation and spoil haulage. Tractor shovels, rubber-tired combination sweeper and drill units and pinning machines continued as favorites for preparing the coal for loading.

BELT CONVEYORS: Added Starters in Transportation . . .

The first belt-conveying system for carrying coal from the pit to the preparation plant went into service in Illinois. Teamed with the belts are portable steel bins that are towed to new locations as the belt is extended. Savings achieved with the belt-transportation system include elimination of the cost of building and maintaining high-speed truck roads; lower maintenance costs as compared to truck repair; movement of larger tonnages from the loading shovel to the belt systems with

fewer and smaller trucks; and recovery of the belts after the coal is depleted.

At other operations, big tractor-trailer units gained in favor and were instrumental in improving haulage efficiency. At one Ohio mine the purchase of ten 52-ton tractor trailer units made possible a 58% reduction in truck operating costs.

Special automatically opening and closing gates were developed for 22-ton end-dump trucks to permit the trucks to carry a full load, prevent spillage along haulage roads and speed loading and unloading at an Illinois mine.

Well-constructed and properly aligned roadbeds also received careful attention as more larger haulage units went into service. Road maintenance continued in the spotlight as producers sought to keep tire and truck maintenance at a minimum while operating trucks at top efficiency.

AUGERING: Widens Stripping Horizons . . .

Highwall augering continued as an important adjunct to stripping in 1954. Augers also were used to recover coal between the outcrop and abandoned deep mines. Output per auger ranged from 100 tons per shift in thin coal to 800 tons or more in thick seams. Production usually was carried out 5 days per week, with coal being stockpiled when preparation plants were idle. Where ample augering territory was available, machines frequently were worked three shifts per day. Augering depth depended on the conditions at the various mines but usually did not extend beyond 200 ft.

STRIPPING AUXILIARIES: Performance Boosters . . .

Auxiliary services in 1954 were designed to increase productive time for all stripping equipment. Special emphasis was placed on effective maintenance programs and special material that would reduce down time. Spare dragline buckets, rotated regularly, regular changing of bucket teeth; use of hard-surfacing materials at wear points; and more attention to lubrication of drag fairleads were key factors in getting top performance from a dragline at a Pennsylvania operation. Standardization of equipment parts, along with a preventive maintenance program and assignment of machine operators to the same unit, have resulted in less down time, minimum repair charges and longer life for equipment at another operation.

Rapid communication between supervisors, equipment operators and

shop with the aid of radio units improved supervision and maintenance at widely scattered operations.

Preparation

Uniform quality was stressed in coal preparation in 1954 as coal producers geared their cleaning facilities to meet more exacting customer needs. Leading the way was fine-coal cleaning equipment, along with dewatering, drying and filtering units. Heavy-media, calcium-chloride washing, wet and dry tables, cyclones and flotation also marked up gains. Recovery of coal from sludge also received more attention throughout 1954 as operators sought to increase coal recovery. More automatic recording charts were installed on cleaning units to provide management with more information about plant performance.

NEW PLANT KEYS: Efficiency and Flexibility . . .

Efficiency in coal cleaning and use of manpower was the keynote in the design of a new Kentucky plant processing 4,000 tpd. Features include plant operation and maintenance with six men; duplicate facilities in key units to reduce the possibility of shutdowns; stainless steel screens; and a 400-ton storage bin.

A new duplicate-flow plant in Ohio provides continuity of preparation with maximum operating flexibility and presents a better opportunity for maintenance during the working shift. To further assure a flow of coal to a nearby power-generating plant, a 9,000-ton stockpile of clean coal is maintained at the plant.

STORAGE CAPACITY: Smooths Plant Operation . . .

Increased storage capacity both for raw and clean coal was incorporated in more plants in an effort to provide continuity of plant operation while maintaining a uniform flow of coal through the plant. Installation of a 1,200-ton raw-coal bin in Ohio upped average plant output from 703 to 800 tph while preventing overloading of crushing, conveying and screening units.

A 5,000-ton raw-coal stockpile in Illinois permits stripping and coal hauling to be carried out independently of preparation. The cleaning plant operates at a uniform feed and coal can be stockpiled nearby to provide material to the plant during inclement weather.

CLEANING FACILITIES:

New Gains in 1954 . . .

New gains were marked up by dense-media, heavy-media and calcium-chloride washers, along with jig washers and upward-current equipment. Wet and dry tables registered additional gains as cleaning units. Crushing and recirculation of middlings continued to advance as operators strove to recover maximum of coal. Flexibility of flow after the coal left the cleaning unit was of prime importance at most plants.

Scalping screens, rotary breakers and crushers were installed in increasing numbers to eliminate handpicking by reducing raw coal to sizes that could be handled by the washing units.

Wet tables, air cleaners and flotation units continued as favorites in fine-coal cleaning in 1954. Predrying of coal before air-tabling was carried out at some plants to permit cleaning units to perform at maximum efficiency.

Froth-flotation units and wet tables remained favorites for cleaning fine anthracite and launder screens became more popular for conditioning feed. Cyclones and vibrators were teamed up for dewatering the clean anthracite flotation product. Another of the new-type classifying conditioners for flotation work employing an airlift to remove high-ash impurities concentrated at the bottom of the unit was put in service in anthracite. The air-lift operates about 20 min per hr while preventing build up of high-ash material in the system.

Recovering fine coal from slurry ponds or from plant slurry was emphasized throughout the year. Cyclones, filters and vibrators were used in various combinations along with flotation.

A new fine-coal distributor designed to permit pulp distribution between any specified number of following units, any one of which always is held in reserve, was put in service in 1954. It is equipped with remote electrical control so that the standby unit may be selected easily by a push-button on the plant central control board.

Increased attention was given to closing preparation-plant circuits by adding cyclones teamed with vibrators of filters, or solid-bowl classifiers and centrifuges. An earthen-basin thickener went into service for the first time in the coal industry at a Pennsylvania mine. Installation costs were appreciably lower than for a conventional type of tank construction. Clarified overflow is returned to the washing plant while the underflow is dewatered by disk filters with the filter cake passing to refuse.

Mechanical and thermal drying

New Anthracite Preparation Facilities in 1954*

Coal Company	Plant Location	Capacity, TPH	Preparation Equipment
Atkins Coal Co.	Frackville, Pa.	125	Wilmot ¹
Beaver Brook Coal Co.	Beaver Brook, Pa.	50	Wilmot ²
Colmac Coal Co.	Branchdale, Pa.	65	Wilmot ³
George W. Huss Contracting Co.	Beaver Brook, Pa.	200	Western Machinery ⁴
Glen Alden Coal Co.	Ashley, Pa.	210	Wilmot ⁵
Jeddo-Highland Coal Co.	Jeddo, Pa.	65	Dorr-Oliver ⁶
K. M. F. Coal Co.	Middleport, Pa.	18	Wilmot ⁷
Minersville Coal Co.	Minersville, Pa.	10	Deister Concentrator ⁸
Pennsylvania Coal Dredging Co.	Easton, Pa.	100	Wilmot ⁹
Pine Creek Coal Co.	Spring Glen, Pa.	20	Deister Concentrator ¹⁰
Pompey Coal Co.	Jessup, Pa.	15	Wilmot ¹¹
Reidinger Coal Service	Paxinos, Pa.	20	Wilmot ¹²
Reilly Contracting Co.	Wiconisco, Pa.	10	Deister Concentrator ¹³
Underkoffler Coal Co.	Lykens, Pa.	65	Wilmot ¹⁴
		15	Wilmot ¹⁵

*Includes installations of new preparation units in existing structures.

1. New plant including Wilmot hydrotators, Type D jig and Wilmot classifier. 2. Wilmot cone cleaner. 3. Wilmot classifier. 4. Heavy-media plant with Wemco drum and coal spiral. 5. Wilmot Hydrotators, Hydrotator-classifiers and jigs.

6. 26-ft Dorro hydroseparator. 7. Wilmot Hydrotator. 8. SuperDuty Diagonal-Deck table. 9. Wilmot heavy-density system. 10. Wilmot Type A jig.

11. Wilmot froth classifier and auxiliary equipment, including Denver conditioner and Heyl & Patterson cyclones. 12. Wilmot Hydrotator-classifier.

found increasing applications in preparation-plant design. Cyclones, along with various types of filters, were used increasingly for the extreme fines. Mechanical and thermal driers or mechanical alone, were dewatering coal up to 3% in top size. Thermal units usually handled final drying of coal up to 1½ in in size.

Stainless-steel stationary screens installed in scraper conveyors or ahead of dewatering screens marked up new gains as an aid to vibrator units handling stoker sizes.

FLEXIBILITY: Keys in Sizing and Loading . . .

At an Illinois mine, flexibility was incorporated in plant design to permit coal to be loaded in railroad cars, delivered to domestic retail bins or stockpiled as required. Plant flow also was designed to permit a large variety of products to be made in various quantities and at the same time facilities were included to crush and rescreen the larger products.

Truck service at an anthracite breaker was streamlined by installation of facilities that permit fast, accurate and automatic loading of six coal sizes. Included in the system are six storage bunkers, each equipped with electrically controlled gates; belt conveyors for conveying and distributing coal to the bins; and push-button control of coal distribution to the bunkers and to the trucks. Two men operate the plant which offers speedy, economical service to retail customers.

Shaking screens continued popular for sizing the larger fractions while vibrator units made gains for sizing and dewatering the smaller sizes. To improve screen performance and pre-

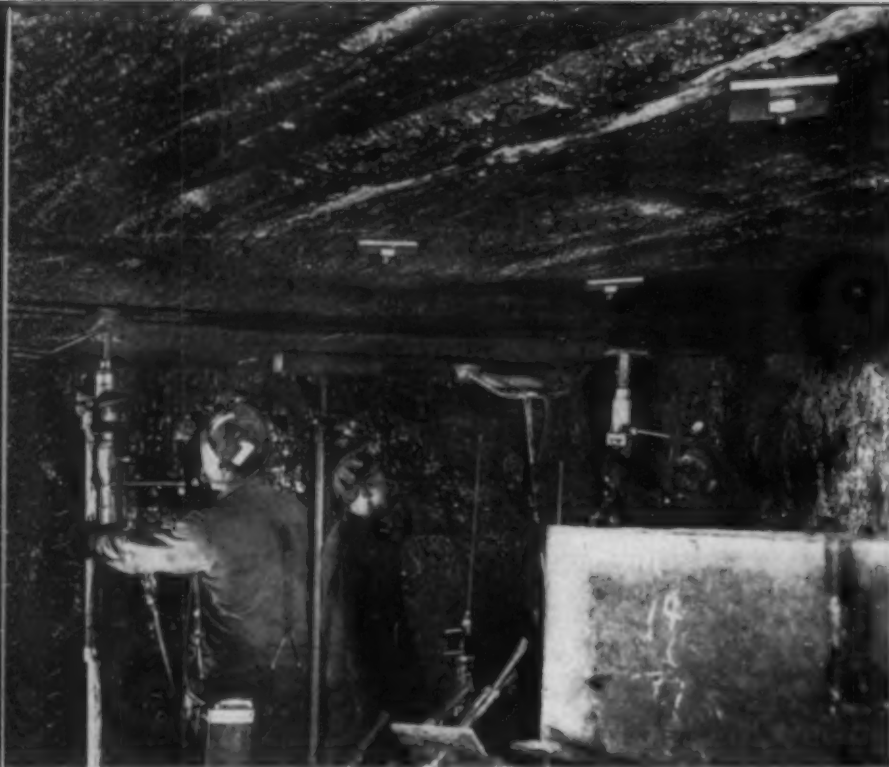
vent blinding, heated screen cloth gained in favor. New design features permitted screen cloth to be heated with approximately one half the power previously required. Secondary crushing, rescreening and blending also moved forward. Dust and freezeproofing of coal with chemicals and oil increased and tramp iron removal received more attention as efforts were directed to giving the customer an improved product.

AUXILIARY SERVICES: For Improved Plant Operation . . .

Long-lived materials such as special alloys and stainless steel were heavy favorites for lining chutes and conveyors as protection against abrasion and corrosion. Plastic and rubber pipe were assigned the task of carrying abrasive slurry or corrosive water.

More emphasis was placed on dust collection both in the plant and from the discharge stacks of heat driers. Wet scrubbing units were effective in reducing the fine material being discharged to the air from driers and were growing in numbers. Manually operated vacuum-type cleaners became more widespread as efforts were pointed toward preventing the accumulation of dust in the plant, particularly around motors and electrical control centers. Duplicate key units such as pumps, and sometimes complete duplicate units throughout the plant, were installed to insure continuity of plant operation.

Refuse disposal was handled mostly by trucks but flexible rock-haulage units teamed with a bulldozer were effective at a Pennsylvania mine. Pumping of refuse to disposal areas also increased in 1954.



FEWER ROOF-FALL ACCIDENTS, through better roof-support practices and stepped-up training, was a major safety goal in 1954.

Safety in 1954

EARLY DATA indicate that coal's 1954 safety performance, as reflected in the rate of fatalities per million short tons, was about level with the top-drawer record for 1953, which may be a practical demonstration of the fact that the better the safety record the more difficult it becomes to improve it. The conclusion is driven home, therefore, that further progress demands the application of doubled and redoubled safety effort—and there are gratifying indications that such effort is not wanting. Witness, for one example, the industry-wide forces now being marshalled to further reduce the toll of the No. 1 killer—roof falls.

Pinpointing the year's performance, the preliminary figures show that a total of 395 men lost their lives in anthracite and bituminous mines in 1954, against 460 in 1953. Admittedly, fewer deaths occurred in 1954, but the rates tell the story. The combined rate in 1954 was 0.94 fatalities per million short tons, same as 1953, pending possible revision. In bituminous mines, the 1954 rate was 0.85 fatalities per million tons and the 1953 rate was 0.87. In anthracite, the rates were 2.29 and 2.07 fatalities per million tons in 1954 and 1953, respectively.

One major disaster jarred the industry. An explosion in northern West Virginia Nov. 13 claimed 16 victims. Thorough investigation was delayed by the necessity of sealing the mine,

leaving the cause undetermined at the time of this writing, though there is surmise in some quarters that natural gas from an old well or a nearby underground storage reservoir might be involved.

Safety achievements during the year in the various phases of the industry included the following:

INCREASING ROOF SAFETY

The big news concerns the establishment of an over-all industry group organized for the purpose of studying the roof-control problems and making recommendations as to the best methods of counterattack. As the year drew to a close the group already was at work. In Pennsylvania, one state inspector from the anthracite division and one from bituminous were released from virtually all other duties to concentrate on roof-control studies and to co-ordinate roof safety efforts throughout the state.

Roof bolting continued to spread to new mines and areas, contributing to remarkable gains in safety. A Bureau of Mines report issued late in the year tells, for example, that coal mines are installing about 2 million bolts per month to support the roof over more than 25% of the nation's bituminous production. The report further shows that bolting must be credited for a large measure of increased roof safety. In operations under bolted roofs the

rate is 0.257 roof-fall fatalities per million tons, against a rate of 1.33 roof-fall fatalities per million tons where coal is recovered under timber supports, in the period from July 1, 1953, to June 30, 1954.

At a mine in Utah roof bolts permit a reversal of the usual system of bench-mining a thick seam. The top bench is mined first and the roof is bolted, then the lower bench is recovered in greater safety and with higher efficiency.

In anthracite roof bolts have shown to advantage in holding up roof in wide chambers where timber supports failed to do the job. An innovation, also in anthracite, is the installation of 15-ft-long bolts in the footwall in stripping from steeply-pitching veins to prevent slides of the footwall rock into the pits. Again in anthracite, yielding steel props and yielding steel rings are contributing to safer pillar recovery and gangway maintenance.

Changes in the methods of installing steel supports and cribs along modified longwall faces have increased safety in this type of operation. In at least one instance, the practice of connecting steel roof supports into a continuous beam has been discontinued to prevent local falls from riding out an entire line of jacks.

Increased interest now is centered on the safety pros and cons of roof-bolt recovery, wider spacing between bolts and the use of smaller-diameter bolts made of high-strength steels. On the other hand, where timber is used for roof support officials and inspectors were more and more insistent on strict adherence to standard timbering.

ACCENT ON HAULAGE

Heavy rails and better roadbeds were the order of the day in track-haulage systems, where the trend toward larger cars and heavier locomotives continued to be in evidence. The newest of these heavy units exhibit design features recommended by the engineering committee of the coal-mining section of the National Safety Council and other groups in the interest of increased safety for equipment operators. Similar studies on shuttle cars were in the works.

At a new West Virginia mine (see *Coal Age*, January, 1955, p 56), main-line switches had been equipped with electric throws, operated from the locomotive cab, and a well-designed block system and communications network permitted tighter control of haulage movements. A less dramatic, but nonetheless important, development was the awarding of a patent for the invention of a device designed to increase safety for brakemen handling cars with link-and-pin couplings.

U. S. Coal-Mine Fatalities in 1954 and 1953*

Cause and Location	Bituminous				Anthracite				Total			
	Fatalities		Rate ¹		Fatalities		Rate ¹		Fatalities		Rate ¹	
	1954	1953	1954	1953	1954	1953	1954	1953	1954	1953	1954	1953
Falls of roof and face.....	178	234	0.45	0.51	39	43	1.44	1.39	217	277	0.52	0.57
Haulage.....	65	78	0.17	0.17	8	2	0.30	0.06	73	80	0.17	0.16
Explosions: Local.....	2	4	0.01	0.01	1	5	0.04	0.16	3	9	0.01	0.02
Major.....	15	5	0.04	0.01	..	..	..	..	15	5	0.04	0.01
Explosives.....	5	4	0.01	0.01	..	1	..	0.03	5	5	0.01	0.01
Electricity.....	11	12	0.03	0.03	1	2	0.04	0.06	12	14	0.03	0.03
Machinery.....	14	8	0.04	0.02	..	..	..	..	14	8	0.03	0.02
Mine fires.....	1	..	..	..	..	..	..	..	1	..	..	..
All other.....	..	4	..	0.01	2	7	0.07	0.23	2	11	..	0.02
Total underground.....	291	349	0.74	0.76	51	60	1.88	1.94	342	409	0.82	0.84
Surface: Haulage.....	12	13	0.03	0.03	1	1	0.04	0.03	13	14	0.03	0.03
Electricity.....	1	4	..	0.01	..	..	..	..	1	4	..	0.01
Machinery.....	2	4	0.01	0.01	..	1	..	0.03	2	5	..	0.01
All other.....	11	5	0.03	0.01	4	2	0.15	0.06	15	7	0.04	0.01
Total surface.....	26	26	0.07	0.06	5	4	0.18	0.13	31	30	0.07	0.06
Stripping: Haulage.....	2	1	0.01	..	3	..	0.11	..	5	1	0.01	..
Electricity.....	3	3	0.01	0.01	..	..	..	..	3	3	0.01	0.01
Machinery.....	4	9	0.01	0.02	2	..	0.07	..	6	9	0.01	0.02
All other.....	7	8	0.02	0.02	1	..	0.04	..	8	8	0.02	0.02
Total stripping.....	16	21	0.04	0.05	6	..	0.22	..	22	21	0.05	0.04
Grand Total.....	333	396	0.85	0.87	62	64	2.29	2.07	395	460	0.94	0.94

*All figures are subject to revision. ¹Fatalities per million short tons. ²Less than 0.005.

Belt transportation had its share of attention. For example, all belts at a modern mine in Illinois are inspected after shutdown to make certain everything is shipshape, and a separate control line contains fusible links which interrupt power if heating occurs. The aim is to head off possible fire hazards that might result from stuck idlers and so on. Belt manufacturers and the Bureau pulled out all stops in their search for fire-resistant materials for belts.

Automatic belt controls were improved during the year, and early reports of an eddy-current clutch on the high-capacity drive of an Illinois slope belt emphasized the safety features of the unit. More main belts were operating in separate splits of air and more fire-control systems were installed.

DUST CONTROL, VENTILATION

Dust-control efforts continued to be directed toward protecting men from the health hazards of siliceous dusts encountered during roof drilling and in development work in rock. Wet suppression and dry collection occupied center stage, with new starters in these fields undergoing rigorous testing. And efforts to clamp down on the explosion hazards of coal dust continued with undiminished vigor, both underground and on the surface.

Wet rock-dusting methods and equipment for use in the face cycle were developed in Illinois during the year, using compressed air to apply a rock-dust slurry. An auxiliary exhaust fan was in service in a Pennsylvania mine with a corollary objective of reducing dustiness at the face while ful-

filling its main mission of providing a greater volume of air over a continuous-mining machine.

On the surface, where at least two coal-dust explosions in surface buildings pointed up the need, the emphasis was on good housekeeping, scheduled cleanups, closely-controlled coal drying and careful welding.

ELECTRICITY, EXPLOSIVES

Greater protection for underground workmen resulted from improved installation of power transmission lines, sometimes in covered trenches and sometimes in separate mine openings. Hazards of mine fires or explosions of electrical origin were greatly reduced as more and more conversion substations were isolated in their own splits and equipped with automatic fire doors and adequate protective devices.

The shock hazard was further attacked through better protection of open conductors and continuing interest in finding improved grounding methods and devices.

The stress in handling explosives still was on strict adherence to the approved rules, but new ideas were forthcoming in this phase of operations also. For example, a hinged spring-loaded shunt was developed to which the ends of the lead wires could be attached and which must be opened against the spring to permit connection of the circuit to the blasting machine.

REVAMPING MINING METHODS

As previously mentioned, the operators of a Utah mine increased safety

by reversing the usual order of bench mining. The safety value of concentrated operation was demonstrated in Kentucky where a 2,000-tpd mine gets all its tonnage from one section. Ventilation is thereby simplified and safety is served by sealing all worked-out sections and venting them to the surface.

In anthracite, one operator has converted to induced-caving methods in a steeply-pitching vein to gain the double advantages of higher efficiency and increased safety.

Other things equal, some operators have selected continuous-mining machines which produce circular-arc ribs as a step toward better roof control, and close study of conditions in numerous pillar sections has led to revamped methods for increased safety. Flatter pillar lines, in some instances, were found to be particularly helpful.

TRAINING WORKERS

The spread of 100% accident-prevention training throughout more companies in anthracite and bituminous was one of the safety highlights of the year. Producers and union officials in areas where the training had been given were unreserved in their acclaim of the program and gratified with the results. Expansion of the program now is on the Bureau's agenda.

Local mining institutes, the Holmes Safety Association and producer groups also carried on aggressive information and education programs. The Holmes Safety Association announced new awards, available to men completing 20 or 30 yr of safe service in the mineral industries.

1954 Sales of Mining Equipment

By W. H. YOUNG, Chief, Bituminous-Coal and Lignite Section,
and R. L. ANDERSON, Supervisory Commodity-Industry Analyst,
U. S. Bureau of Mines, Washington D. C.

Table 1—United States Bituminous and Lignite Production by Methods of Mining and Mechanical Cleaning

	1952		1953		1954*	
	Thousands of Net Tons	Per Cent of Total	Thousands of Net Tons	Per Cent of Total	Thousands of Net Tons	Per Cent of Total
Hand-loaded underground.....	87,431	18.7	71,222	15.6	52,000	13.3
Mechanically loaded underground	268,994	57.7	278,329	60.8	244,000	62.2
Mined at auger mines.....	1,506	0.3	2,291	0.5	3,000	0.8
Mined by stripping.....	108,910	23.3	105,448	23.1	93,000	23.7
Total production.....	466,841	100.0	457,290	100.0	392,000	100.0
Mechanically cleaned.....	227,265	48.7	241,759	52.9	224,000	57.1

*Preliminary.

Table II—Underground Bituminous and Lignite Production, by Methods of Loading

	1952		1953		1954*	
	Thousands of Net Tons	Per Cent of Total	Thousands of Net Tons	Per Cent of Total	Thousands of Net Tons	Per Cent of Total
Mobile-loading machines:						
Loading direct into mine cars.....	75,605,379	21.2	65,910,130	18.9	.....²	.....²
Loading onto conveyors.....	11,078,827	3.1	10,532,695	3.0	.....²	.....²
Loading into shuttle cars.....	132,297,476	37.1	156,142,324	44.6	.....²	.....²
Continuous-mining machines.....	8,214,757	2.3	11,830,097	3.4	.....²	.....²
Scrapers.....	76,969	.....¹	238,839	0.1	.....²	.....²
Conveyors equipped with duck-bills or other self-loading heads.....	10,590,076	3.0	8,530,949	2.4	.....²	.....²
Hand-loaded conveyors.....	31,130,505	8.8	25,143,948	7.2	.....²	.....²
Total mechanically loaded.....	268,993,989	75.5	278,328,982	79.6	244,000,000	82.4
Hand-loaded into mine cars.....	87,431,370	24.5	71,221,990	20.4	52,000,000	17.6
Total underground production.....	356,425,359	100.0	349,550,972	100.0	296,000,000	100.0

*Preliminary.

¹Included with "Total mechanically loaded."

²Less than 0.05 %.

Table III—Mechanical-Loading and Conveyor Units Sold for Underground Use, As Reported by Manufacturers

	1949	1950	1951	1952	1953	1954	Per Cent Change From 1953
Bituminous and Lignite:							
Mobile-loading machines.....	286	289	287	206	180	92	- 49
Continuous-mining machines.....	.....¹	.....¹	.....¹	.....¹	57	101	+ 51
Augers.....	.....¹	.....¹	.....¹	.....¹	57	55	- 4
Scrapers ²	8	1	4	8	11	5	- 55
Shuttle cars.....	543	465	524	428	437	242	- 45
Conveyors ³ :							
"Mother".....	116	132	114	67	58	19	- 67
Room or transfer.....	394	316	297	155	87	61	- 30
Face ⁴	160	116	111	76	49	115	+ 135
Pennsylvania Anthracite:							
Mobile-loading machines.....	.....	.....	.....	.....	1	17	+1,600
Continuous-mining machines.....	.....	.....	.....	.....	.....	1	.....
Scrapers ²	10	8	8	5	3	.....	.....
Shuttle cars.....	.....	.....	.....	.....	.....	14	.....
Conveyors ³ :							
"Mother".....	.....	1	.....	.....	.....	.....	.....
Room or transfer.....	147	57	34	34	16	24	+ 50
Face ⁴	5	.....	8	13	2	11	+ 450
Number of manufacturers reporting.....	22	20	21	22	25	23	.....

¹ Not available. Total number of augers sold 1946-53, inclusive, was 271.

² Reported as scrapers or scraper haulers and hoists.

³ Conveyors are classified as to the length the

power unit has capacity to take: "Mother," capacity over 500 ft; room or transfer, capacity 100 ft to 500 ft; face, capacity under 100 ft.

⁴ Includes "bridge" conveyors, beginning in 1950.

SHIPMENTS of mechanical-loading equipment for underground use in coal mines in the United States, in terms of capacity, were 10% less in 1954 than in 1953. The capacity of mechanical-cleaning equipment sold for use at bituminous mines was 11% less in 1954 than in 1953. Shipments of shuttle cars, "mother" conveyors and room or transfer conveyors for use in coal mines in the United States decreased in 1954 from 1953, while face conveyor shipments increased during the same period.

This survey was made possible by the courteous co-operation of all known manufacturers of mechanical-cleaning equipment for bituminous-coal mines and manufacturers of mechanical-loading and supplementary haulage equipment for use in all coal mines in the United States. Data from various trade journals also were utilized.

"Sales in 1954" of mechanical-loading units and supplementary haulage equipment represent shipments made during the year. Of the total capacity of mechanical-cleaning equipment sold in 1954, 61% was placed in operation during that year. The remaining 39% will be installed later.

Mechanical Loading

Bituminous coal and lignite mechanically loaded in underground mines increased from 268,993,989 tons in 1952 to 278,328,982 in 1953, or 3%. Mechanical loading in Pennsylvania anthracite mines decreased from 10,034,464 tons in 1952 to 6,838,769 in 1953, or 32%.

Table I shows data on bituminous-coal and lignite production, by methods of mining, and mechanical cleaning for 1952-54, inclusive. The percentage of total output mechanically loaded and mechanically cleaned continues to increase. During 1954, approximately 87% of the total output was mechanically loaded at underground mines, loaded by power shovels at strip mines or mined by augers along highwalls in strip mines.

Underground production of bituminous coal and lignite, by methods of loading, is shown in Table II. The preliminary figures for 1954 reveal that 82% of the underground output was loaded mechanically, with the other 18% handloaded into mine cars.

Auger Mining—The use of augers for coal recovery along highwalls in strip mines began about 1945, but separate data on number of augers in

Not subject to copyright.

Table V — Mechanical-Loading Equipment in Use in 1953, With 1954 Sales

State	Mobile Loaders		Continuous Miners		Scrapers		Room Conveyors ¹		Augers	
	In Use in 1953	Sales in 1954	In Use in 1953	Sales in 1954	In Use in 1953	Sales in 1954	In Use in 1953	Sales in 1954	In Use in 1953	Sales in 1954
Bituminous and Lignite:										
Alabama.....	123	12	8	2	..	..	137	1	..	1
Alaska.....	3	2	..	2	10	..	3	3	..	..
Arkansas.....	..	..	..	..	..	..	64	..	..	..
Colorado.....	36	1	5	..	..	1	211	..	..	..
Illinois.....	309	1	20	6	..	..	13	..	..	..
Indiana.....	107	1	..	..	..	..	..	..	..	..
Iowa.....	2	..	..	..	..	..	1	..	..	..
Kentucky.....	471	17	13	..	..	..	526	15	4	10
Maryland.....	..	..	..	..	..	..	12	1	3	..
Montana.....	31	..	..	..	..	..	6	..	..	..
New Mexico.....	16	..	..	..	4	..	2	..	..	..
North Dakota.....	4	..	..	..	..	..	..	..	..	..
Ohio.....	164	..	17	1	..	..	58	1	10	12
Oklahoma.....	5	..	..	..	..	..	127	..	..	..
Pennsylvania.....	927	5	112	38	9	2	666	..	7	9
Tennessee.....	28	..	..	..	..	..	54	..	3	..
Utah.....	123	5	2	3	..	..	45	..	..	..
Virginia.....	144	11	2	2	..	..	119	10	3	1
Washington.....	..	..	6	..	6	..	95	..	..	..
West Virginia.....	1,456	37	32	47	..	..	1,496	30	64	22
Wyoming.....	36	..	2	..	..	2	208	..	..	..
Total.....	3,985	92	219	101	29	5	3,843	61	94	55
Pennsylvania Anthracite.....	39	17	..	1	489	..	2,784 ²	24	..	..
Grand total.....	4,024	109	219	102	518	5	6,627	85	94	55

¹ Includes hand-loaded conveyors and conveyors equipped with duckbills or other self-loading heads.

² Includes also pit car loaders.

Table IV—Sales of Mechanical-Loading Equipment in 1954, Compared With Machines in Active Use in Preceding Years

	Number of Machines in Use— As Reported by Mine Operators							1954 Sales ^a
	1947	1948	1949	1950	1951	1952	1953	
Bituminous and Lignite:								
Mobile loading machines.....	3,569	3,980	4,205	4,318	4,410	4,083	3,985	92
Continuous-mining machines.....	..					152	219	101
Scrapers.....	67	56	46	39	22	19	29	5
Pit-car loaders.....	71	37	17	12	.. ¹	.. ¹	.. ¹	.. ²
Conveyors equipped with duckbills or other self-loading heads.....	1,531	1,632	1,483	1,329	1,242	1,049	849	.. ³
Hand-loaded room conveyors, number of units.....	3,979	4,125	4,312	4,434	3,904	3,569	2,994	61
Pennsylvania Anthracite:								
Mobile-loading machines.....	25	19	27	30	43	54	39	17
Continuous-mining machines.....	..	..	..	..	..	..	..	1
Scrapers.....	594	643	589	556	528	456	489	..
Hand-loaded room conveyors, number of units ⁴	3,457	3,562	3,618	3,460	3,282	3,232	2,784	24

^aAs reported by manufacturers in 1954.

¹ Canvass of pit-car loaders was continued in 1951.

² Canvass of sales of pit-car loaders discontinued in 1945.

³ Sales of conveyors equipped with duckbills or other self-loading heads

are included with hand-loaded room conveyors.

⁴ Includes pit-car loaders and conveyors equipped with duckbills or other self-loading heads.

use and tons produced by auger mining was first collected for 1952. Auger mining at bituminous mines in the United States averaged 25 tons per man-day in 1953, compared with 18 tpm at strip mines and 7 tpm at underground mines. Tables 23 and 24 in the Bureau of Mines Mineral Market Summary 2339 shows a comparison of auger mining with other types of mining. A few coal-recovery augers were used in underground bituminous coal mines, and the production from

these mines was included with underground mechanically loaded coal. No shipments of coal augers have been made for use at Pennsylvania anthracite mines.

Reports received from four manufacturers of coal-recovery augers show that 55 augers were shipped in 1954 and that all except one was for use along highwalls at bituminous strip mines. (See Tables III and V.)

Types of Units Sold—Table III lists the units of mechanical loading

and mining equipment shipped for use at all coal mines in the United States, 1949-54, inclusive. Shipments of mobile-loading machines decreased from 181 in 1953 to 109 in 1954, but shipments of continuous-mining machines increased from 67 to 102 during the same period. Shipments of coal-recovery augers, scrapers, shuttle cars, "mother" conveyors, and room or transfer conveyors all decreased in 1954 from 1953. Shipments of face conveyors increased from 51 in 1953

Table VI—Sales of Face Conveyors, Shuttle Cars and "Mother" Conveyors, 1953-54, by States

	Face Conveyors ¹		Shuttle Cars		"Mother" Conveyors ²	
	1953	1954	1953	1954	1953	1954
Bituminous and Lignite:						
Alabama.....			27	26	3	..
Colorado.....			2	..	1	1
Illinois.....			17	1	12	6
Indiana.....			6	2	..	2
Kentucky.....	8	23	49	36	5	..
Maryland.....		1	..	..	..	..
Ohio.....			7	..	..	1
Oklahoma.....			..	..	3	..
Pennsylvania.....	1	..	140	42	14	3
Tennessee.....			2	..	..	..
Utah.....			10	8	1	1
Virginia.....	1	14	45	15	1	..
West Virginia.....	39	77	118	112	18	5
Wyoming.....			14	..	..	..
Bituminous..	49	115	437	242	58	19
Pa. Anthra..	2	11	..	14	..	..
Grand total..	51	126	437	256	58	19

¹ Includes "bridge" conveyors and all other conveyors 10 to 100 ft long.

² Includes all haulage conveyors with capacity over 500 ft, except main slope conveyors.

FOOTNOTES, TABLE VII.

¹ Net tons based on average days mines were active in 1953 and 7 hr per day.

² Included in "Undistributed."

³ Includes some coal mined in Pennsylvania and cleaned in Ohio, and

Table VII—Bituminous Coal Mechanically Cleaned in 1953, With 1954 Sales of Mechanical-Cleaning Equipment

	Number of Plants in Operation	1953	Per Cent Output Mechanically Cleaned	1954
		Net Tons of Cleaned Coal		Annual Capacity of Equipment Sold ¹
Alabama.....	40	11,110,349	88.7	.....
Alaska.....	1	253,570	29.4	.....²
Colorado.....	5	1,618,150	45.3	.....
Illinois.....	69	35,456,970	77.1	728,000
Indiana.....	24	12,650,620	80.0	.....²
Kansas.....	4	1,238,187	72.2	.....
Kentucky.....	77	28,144,723	43.3	937,000
Missouri.....	10	2,156,543	90.1	.....
Montana.....	2	45,035	2.4	.....
New Mexico..	1	95,410	18.6	.....
Ohio.....	25	13,576,190	39.1	.....²
Oklahoma.....	4	623,469	28.8	.....
Pennsylvania..	89	48,776,471 ³	52.3	1,738,000
Tennessee.....	9	535,462	9.8	.....
Utah.....	6	2,540,571	38.8	.....²
Virginia.....	30	7,372,207	38.6	541,000
Washington..	11	671,246	97.3	.....
West Virginia..	204	74,893,404 ⁴	55.8	3,930,000
Undistributed.	..	..	..	537,000
Total..	611	241,758,677	52.9	8,411,000

a small tonnage mined in other states and cleaned at a consumer-operated plant in Pennsylvania.

⁴ Includes some coal mined in West Virginia and cleaned in Pennsylvania.

to 126 in 1954, or a jump of 147%.

Exports of underground mechanical-loading equipment in 1954, in terms of capacity, amounted to 6% of the shipments to mines in the United States, compared with 15% in 1953.

Types of Mechanical - Loading Equipment Sold Compared With Units in Use—Table IV indicates the trend in demand for various types of mechanical-loading equipment. Mobile-loading machines in use reached the maximum in 1951 at bituminous and lignite mines and in 1952 at Pennsylvania anthracite mines. However, the 1954 shipments of mobile-loading machines were only 2% of the number in use in 1953 at bituminous and lignite mines, compared with 44% at Pennsylvania anthracite mines. The 1954 shipments of continuous-mining machines to bituminous and lignite mines were 46% of the number in use in 1953.

Table V lists the number of mechanical-loading units shipped to various states in 1954, compared with the number in use in 1953 as reported by mine operators. Sales of room conveyors as listed in Table V are not exactly comparable with the number of room conveyors in use. To avoid duplication in tonnage mechanically loaded, mine operators were instructed to report "hand-

loaded" and "self-loading" conveyor tonnage only. Therefore, room conveyors loaded by mobile loaders are not included with "Room Conveyors in Use in 1953."

Haulage Equipment

Shuttle Cars—Sales of shuttle cars decreased from 437 in 1953 to 256 in 1954. Details of shipments to various states in 1953 and 1954 are given in Table VI. There were 4,222 shuttle cars in use in bituminous and lignite mines in 1953. Details of the number of cable-reel and battery-type shuttle cars in use, by states, 1952-53, inclusive, are given in Table 20, Bureau of Mines Mineral Market Summary 2339. Exports of shuttle cars increased 9% in 1954 from 1953.

Face Conveyors—A face conveyor is 10 to 100 ft in length and is used parallel to the face of the room to move material along the face to a room conveyor. Table III lists total sales, 1949-54, inclusive, and Table VI lists sales, by states, for 1953 and 1954. Data on the number in use are not available.

"Mother" Conveyors—For the purpose of this study a "mother" conveyor is defined as a sectional, extensible, power-driven conveying unit that can handle over 500 ft of conveyor. Main-slope conveyors are excluded. Table III lists sales for 1949-

54, inclusive, and Table VI shows shipments by states in 1953 and 1954. In 1953, 322 bituminous coal mines used 304 mi of "mother" conveyors. Detailed data by states on "mother" conveyors in use for 1945-53, inclusive, are given in Table 21 of Bureau of Mines Mineral Market Summary 2339. Exports of "mother" conveyors increased 133% in 1954 from 1953.

Mechanical Cleaning

Reports from 18 manufacturers of bituminous-coal-cleaning equipment show that the total capacity of 1954 sales was 6,230 net tons of clean coal per hour, compared with 7,000 tons of capacity sold in 1953, a decrease of 11%. Sales in 1954, by type of equipment, in terms of capacity, show that dense medium ranked first, followed by jigs and wet tables. The capacity of all types of equipment sold in 1954 for cleaning bituminous coal by wet methods was equivalent to 3% of the bituminous coal cleaned by wet methods in 1953; and the capacity of pneumatic equipment sold in 1954 also was 3% of the tonnage pneumatically cleaned in 1953. Approximately 67% of the total capacity of cleaning equipment sold in 1953 was for additions to present installations, while the remainder, 33%, comprised new plants. Table VII gives data on bituminous cleaned in 1953.

The Coal Commentator

Permanent Business

Eisenhower may fight the Democrats or hold their hands, business may go up or down—your commentator sees it as up for '55 at least—and women may change from "Dior" to some other look, but whatever happens it becomes clearer day by day that "Defense is permanent business." From the President on down, there is little dissent from the conclusion that there is nothing in the international picture to indicate that the United States can afford to relax on the preparedness front for several years at least.

This means that for this period 10 to 15¢ of every \$1 worth of wealth created in the Nation must be applied to maintaining a defense establishment that can effectively halt an attack, or, better yet, prevent one from being even mounted. Expenditures of this magnitude are and will remain a burden, but the burden can be borne and the upward trend in the standard of living maintained and accelerated by efficiency in production. So, coal-mining managers and coal miners, along with men in all productive operations, have an added incentive to attain maximum output per man.

Maybe You Too

Stanton, Ill., Dec. 22 (Special)—A \$200,000 fire today destroyed the tippie, screening system and equipment at the mine of the Livingston & Mt. Olive Coal Co.

Desirable increases in coal-mining activity in 1954 also were accompanied by undesirable: for example, fires both on the surface and underground. They seem to be increasing. Underground, between July, 1952, and August, 1954, the Bureau of Mines investigated 64 fires. There were many others. Even more foreboding, the number of tippie explosions, though still small, also showed an increase in 1954.

Moral: A fire, or a tippie dust explosion, can happen to you, too, unless you take active steps to prevent it.

Unforeseen Consequence

Railway dieselization has had direct and formidable consequences in the coal-mining industry and to a lesser extent in other industries, including the railways themselves. But the effects have been much wider and far flung. For example, a cinder and concrete-block plant at Paintsville, Ky., is now having a hard time because its last good source of

cinders—the coal-burning locomotive—is no longer.

Probably the number of others likewise affected is small, but the situation does highlight the rise of lightweight aggregate, as well as the increasing demand for an older and more-basic material—cement—in construction. At least two plants have been built at mines to convert refuse into aggregate, and a third is well on its way to completion. The total of such plants probably never will be large but there will be more. Meanwhile, experts in the business forecast that the portland cement industry will increase its capacity up to 50% or more in the next 2 or 3 yr, meaning that coal can expect some additional business. Needless to say, it will be appreciated.

Pleasing Irony

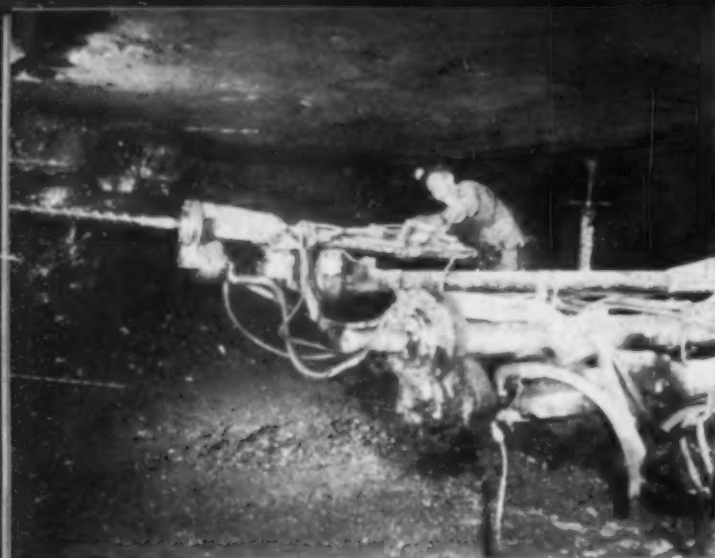
The Department of Irony and Wry Satisfaction this month offers the contrast in coal production and demand in the U. S. and abroad. Producers and government officials are concerned with the low operating rate in the United States, which was the only major producing nation to show a drop in 1954. In contrast, both government and the public in Great Britain were concerned that the increase there was not nearly sufficient to meet demand, with the result that the government announced a campaign to stretch supplies by reducing waste. Fuel experts also were forecasting a continued gap between supply and demand in Europe, to be met by withdrawals from stocks and "considerably increased imports of United States coal"—the wry satisfaction angle for U. S. producers.

Things to Come

Look for in an early issue of Coal Age, an article on the development of solid tires for shuttle cars, particularly low-vein cars. Diameter of the solid tires is less, lowering car height correspondingly, and the solid tires reportedly ride easier. This is only one of the many things coal men and manufacturers have been working on to increase efficiency and cut cost. Among others, look for these:

A revolution in overburden preparation at strip mines as a result of development of new methods that materially reduce cost.

A substantial increase in the productivity of standard continuous miners, and in the use of remotely controlled units, as a result of new developments and improvements in transportation equipment, particularly conveyors.



TWIN-BOOM UNIT packs plenty of capacity for drilling. Four holes are required in headings and five in rooms.



HIGH-CAPACITY LOADERS, skilled operators and good conditions are teamed for high production at Coiltown.

Matched-Capacity Equipment Keys Coiltown Mining



CUTTER WITH BUGDUSTER undercuts coal, leaving a clean kerf. To allay dust, coal is sprayed with water.



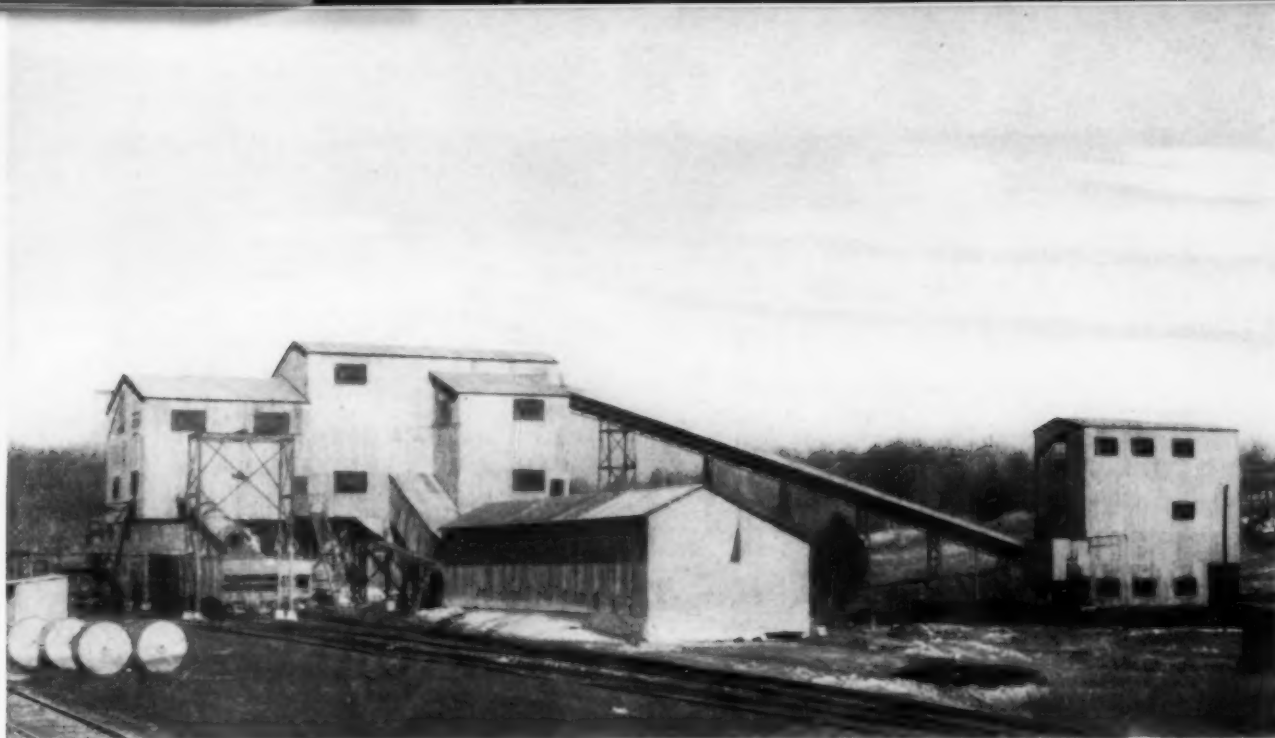
SHUTTLE CARS provide haulage link between face and belt. Car operator controls water spray with pull cord.



MAIN-ENTRY BELT travels 450 fpm while carrying well-centered load of coal to 75-ton hopper at bottom of slope.



SLOPE BELT is protected throughout entire length by semicircular steel lining secured to concrete foundation.



MODERN WASHING, screening and loading facilities prepare Coiltown coal for market. Raw coal is reduced to 7x0 in breaker house at right before it is delivered to the washer section.

Modern Mine Serves Utilities

How a new company was organized to develop a 4,000-acre tract of west Kentucky No. 9 coal to supply TVA.

WHAT ARE THE INGREDIENTS that go into the development of a modern mine to supply coal to a highly competitive expanding market? Among the most important are ample coal reserves, good mining conditions, a favorable geographic location with low-cost transportation, and experienced mine management. If you have these ingredients you are ready to go after the business. And that's what the owners of the Coiltown Mining Co. did when they submitted bids to the TVA in the spring of 1951.

Initial bids by Coiltown and many other companies were opened on April 1, 1951, and Coiltown was one of the low bidders. However the initial bids were rejected and new ones were called for. The new bids were opened in July, 1951, and again Coiltown was one of the low bidders. On the basis of the results of the bids, Coiltown management started planning the development of a fully mechanized modern mine to be operated two shifts per day, 5 days per week. After plans were completed, some preliminary work was started at the mine site in anticipation of being awarded a contract. In November, 1951, Coiltown was awarded a con-

tract to supply TVA with a substantial tonnage of coal and immediately the new company speeded mine development.

The men behind the development of the new mine include: Than G. Rice, president; James H. Riley, executive vice president; Weldon M. Brown, vice president, sales; Marlon Rakestraw, vice president; John T. White, secretary; and R. W. Waskom, treasurer. These men are veteran mine operators in Hopkins and Webster counties, Kentucky, with up to 35 yr of experience.

DEVELOPING THE MINE

Coiltown's Klondike mine taps a 4,000-acre tract of west Kentucky No. 9 coal that averages 60 in thick. The mine, a slope operation, is about 12 mi west of Madisonville and is served by the Illinois Central and L.&N. railroads. The property is in a favorable location that permits coal to be shipped either by rail or a combination of rail and water.

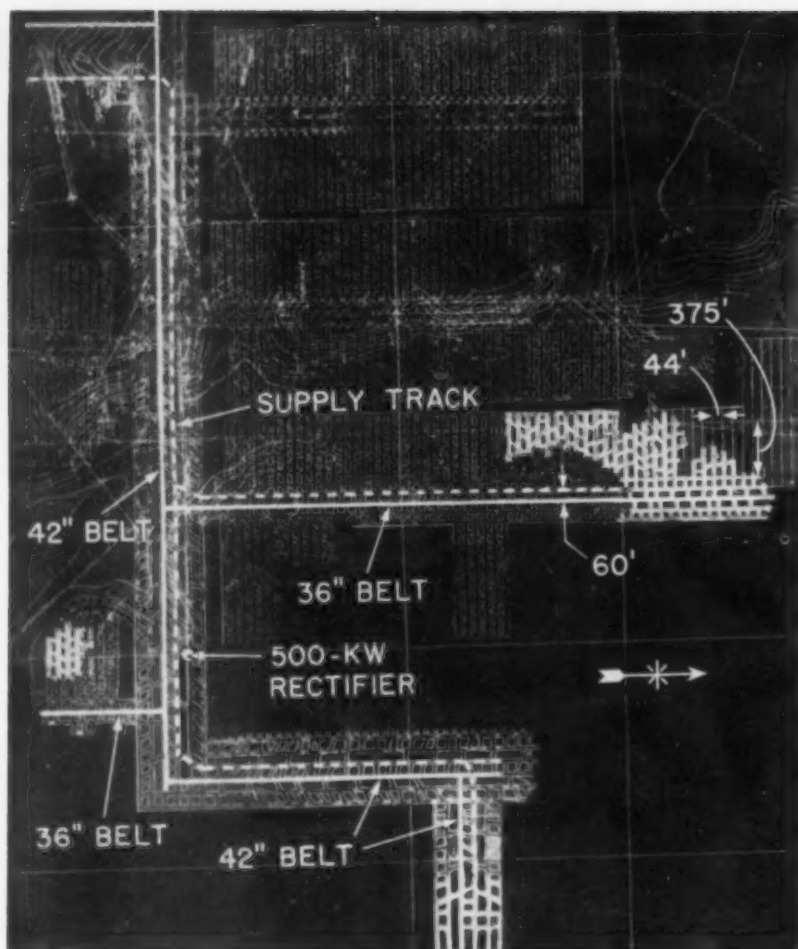
Entrance to the mine is by a pair of slopes that tap the coal 127 ft below the surface. The belt slope was driven 16 deg 48 min with the horizontal and is 492.67 ft long. The sup-

ply slope was driven 21 deg 48 min with the horizontal and is 374.87 ft long.

After the two slopes had been driven to the coal, they were connected and track was laid in the supply slope. A Lidgerwood hoist was installed on the surface to bring coal out in mine cars during the period the slope bottom was being developed. Equipment assigned to the bottom development job included a Joy 8-BU loader, 10-RU cutter, two 42E shuttle cars and a hand-held electric drill. While development was moving forward in the coal, rock work was progressing to develop a 75-ton surge bin at the foot of the belt slope.

When the hopper was completed, a 42-in Joy belt conveyor, equipped with 5-ply, $\frac{3}{4} \times \frac{3}{16}$ Raybestos-Manhattan AIH Homocord belt was installed in the belt slope. Capable of handling 450 tph while traveling 450 fpm, the unit is driven through a Jones speed reducer by a 125-hp 220-v Reliance motor.

The development equipment was used to advance six headings eastward from the slope to tap the main body of the coal. After sufficient territory was developed, the main-entry belt was installed in the No. 3 heading and a supply track was laid in the No. 4 heading. Panel development was started as soon as the main entry had advanced far enough. The main-entry



MINE DESIGN includes 42-in belts in mains and 36-in units in room panels. Separate track eases handling of men and supplies.

development equipment was moved into the panel to speed development necessary to permit addition of more mining equipment and a 36-in belt conveyor. A second loading unit was added in the room panel when development permitted and a third was added shortly thereafter to continue development in the main entry.

MINING CONDITIONS

The No. 9 seam, as noted, averages 60 in thick at the Klondike mine, and has some small irregular partings. It is overlain by black shale which usually makes good roof. Underneath is hard fireclay. The regional dip is $1\frac{1}{2}\%$ to the northeast and no faults have been encountered. Although no methane has been detected and the mine is classed as non-gassy, Coiltown operates it with the same rigid standards as a gassy mine.

HOW THE COAL IS MINED

The production assignment at Klondike is handled by three face units operating two shifts per day. Entry-

development crews are equipped with Joy 14-BU loaders, two 42E shuttle cars, CD 26 coal drill, RBD 10 or RBD 15 roof-bolting drill, 10-RU cutter with bugduster and Bowdil bar, chain and bits. Room crews are provided with two loaders, three shuttle cars and one cutter but no roof-bolting unit. The roof is strong and needs to be supported only by straight posts and safety jacks in the short-lived areas.

The main-entry development crew drives six headings and breakthroughs while panel-development crews work five headings, room necks and breakthroughs. Room and entry pillars are not recovered. Headings are developed 12 to 14 ft wide on 60-ft centers and rooms are driven 24 to 26 ft wide on 44-ft centers. Output from development crews averages 500 tons per shift while room crews produce up to 700 tons per shift.

Section personnel in development crews includes: 1 foreman, 1 mechanic, 1 loader operator, 2 cutter operators, 2 shuttle-car operators, 1

driller, 1 shotfirer, and 1 roof-bolter, for a total of 10. Room crews include: 2 loader operators, 2 cutter operators, 3 shuttle-car operators, 2 drillers, 1 shotfirer, and 1 timberman: total, 13.

The one man assigned to roof bolting in development work installs up to 100 bolts per shift. Bolts are 30- and 36-in Bethlehem expansion-type fitted with 6x6x $\frac{1}{4}$ -in bearing plates and Ohio Brass plugs.

Coal is undercut to a depth of 8 ft and the bugduster carries the cuttings away so that a clean kerf is left. Each crew cuts an average of 22 to 25 places per shift. To allay dust at the face during the cutting cycle, water is delivered to the sections in 2-in pipe line. A $\frac{3}{4}$ -in hose is used to deliver water to the face.

Four blastholes are drilled per cut in headings and five are required in rooms. Coal is broken with permissible powder.

SERVICING THE MINE

Mine supplies are delivered to the end of the belt on the first or third shifts and are distributed to the working faces on the third shift. A six-man crew loads supplies into mine cars on the surface and sees that they are delivered to the slope bottom. The crew then splits up and two men spend the remainder of the shift distributing the supplies to the face while the other four rock dust and cut coal. Two 6-ton Westinghouse locomotives are used to distribute supplies and handle man-trips.

Ventilating air is supplied by a 5-ft Jeffrey Aerodyne Jr fan delivering 54,000 cfm at a $\frac{1}{2}$ -in water gage.

Power for operating the underground equipment is provided by a 500-kw Westinghouse rectifier. To eliminate construction of underground substation buildings and the top brushing that would be necessary to provide clearance for moving the rectifier, Coiltown mounted the unit on skids and kept it on the surface. Power is delivered underground through a borehole located near the load center. As the mine is extended, a new borehole is drilled and the rectifier is moved. To keep terminal voltage at or near rated values, substation moves are made every 3,000 ft. Power is transmitted to the working areas by 1 million cir mil positive and negative feeders.

ALL-BELT HAULAGE

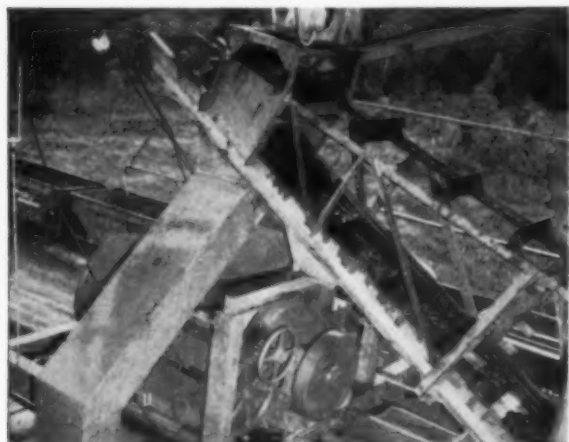
Coiltown's coal is hauled over a system of Joy 36- and 42-in conveyor belts. The main haulage is made up of the following conveyors: a 3,500-ft unit in the East Main, a 1,500-ft conveyor in the Third North Main and a 500-ft section in the No. 2 East Main.



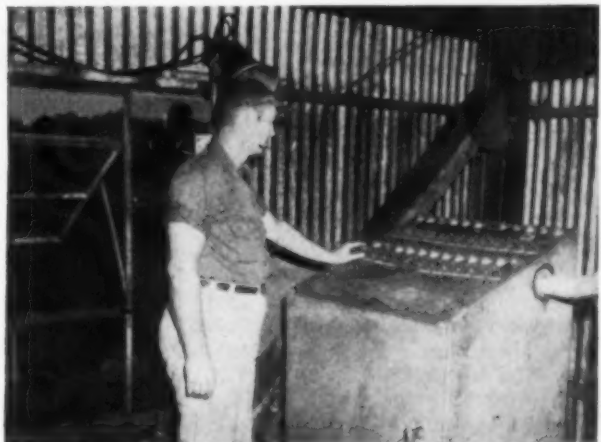
COAL CLEANING is assigned to two-compartment five-cell washer, which makes a three-product separation.



PRIMARY SIZING of washed coal into 7x4, 4x1½ and 1½x0 is handled by 6x16-ft vibrator.



CLEAN-COAL CRUSHER is installed over loading tracks and discharges crushed coal to cars by chute.



CLEANING-PLANT CONTROL is centered in compact panel. Features include sequence starting and interlocking.

Two 36-in units deliver coal from room panels to the main units. All conveyors are equipped with Raybestos-Manhattan Homocord belt joined with Armstrong-Bray splices.

Personnel assigned to maintenance and operating duties on the belts on the first shift are as follows: 1 belt cleanup man, 4 belt extenders and trackmen, 4 transfer-point men and 1 patrolman.

General maintenance of underground equipment is assigned to 1 electrician, 2 underground repairmen, 2 shop men on the first shift and 2 additional shop men on the second.

PREPARING THE COAL

The main-slope belt discharges coal into a 9x16-ft McNally-Pittsburg rotary breaker which reduces it to 7x0. The through product flows to a 42-in Hewitt-Robins conveyor, equipped with Raybestos-Manhattan belt, and

is delivered to a McNally-Norton two-compartment five-cell washer. There it is separated into clean coal, middlings and refuse. Middlings are crushed to 2x0 by a 24x24 American ring crusher and separated into 2x1 and 1x0. The 2x1 is recirculated to the wash box and the 1x0 goes to refuse.

Clean coal flows to a 6x16-ft Robins double-deck vibrator and is separated into 7x4, 4x1½ and 1½x0. The 7x4 or 4x1½, or both, may be loaded directly into railroad cars or diverted to an American ring crusher and reduced to 1½x0.

The 1½x0 passes over a 6x16-ft Robins dewatering vibrator and is separated into 1½x28M and 28Mx0 fractions. The 28Mx0 flows to a drag tank from which it is pumped to a battery of Heyl & Patterson cyclones. Cone underflow is delivered to a dewatering vibrator and thence to

refuse. Cone overflow is recirculated to the wash box.

Operation of the preparation plant is handled by the following crew: 1 tippie operator, 1 washer operator, 3 car droppers, 1 car cleaner and 1 foreman; total, 7.

Oil-treating and freezeproofing facilities also are included in the plant facilities. A Viking hot-oil system is available to treat stoker coal with 1,000-viscosity oil. Freezeproofing of 1¼x28M stoker coal is with Morton No. 5 salt fed by a Syntrol vibrator.

Officials at the Klondike mine are as follows: J. H. Riley, superintendent; Roy Holland, mine foreman; Jack Shade, assistant foreman, day shift; Robert Davis, assistant foreman, night shift; Jack Dixon, master mechanic; Joe Slaton, preparation foreman, day-shift; W. R. Harris, preparation foreman, night shift; and E. Cotton, purchasing agent.



ON-SHIFT ROCK-DUSTING—Rockduster Aloys Dudra applies a coating with roof-bolters working ahead . . .



THEN COMPLETES the job as soon as the bolting crew move their machine out of the face area.

Applying Wet Rock Dust

Peabody Coal Co. uses compressed air for mixing and applying a rock-dust slurry during the working shift.

DEVELOPMENT OF METHODS and equipment for applying a rock dust-water slurry to roof, ribs and floor in highly mechanized sections at Mine No. 17, Peabody Coal Co., Pana, Ill., now permits rock-dusting to be done during the working shift without interfering with the mining cycle and without leaving rock dust suspended in the air at the face. The water and rock dust are mixed in a pressure vessel and propelled through a hose to the discharge nozzle by compressed air supplied by a portable compressor.

The rock-dusting for two daily production shifts can be done by a single operator working on the first shift. He leaves all working places treated right

up to the face and it is only in rare instances that additional applications must be made on the second shift to keep the treatment within 40 ft of the advancing faces.

As shown in the illustrations, the equipment consists of a skid-mounted tank having suitable air and water connections and the discharge hose. Compressed air now is supplied at 100 psi by a Joy WL-85 mine compressor, but a smaller compressor is to be obtained for integral mounting with the tank on the skid base, thus freeing the Joy unit for other jobs where its full capacity may be better utilized.

The tank itself is made of a 30-in length of 24-in pipe with walls $\frac{5}{16}$ in

thick. The unit is pressure-tested to 325 psi for use with a working pressure of 100 psi. The bottom of the tank is made in the form of an inverted cone with the high-pressure air inlet at the apex. The conical section prevents settling out of the solids which might occur if a flat bottom had been used. At the end of each shift the system is flushed with water, primarily to clean out the discharge hose because the tank is practically self-cleaning.

The top of the tank is a flat plate with a 12-in porthole in the center fitted with a cover plate. The cover plate is hinged to the tank and is equipped with an adjusting screw which insures a tight, non-leaking seal after the locking lever has been set in the locked position.

The locking lever is further secured by the handle of the pressure-relief valve, which closes in such a way that

Results of Analysis of Wet-Applied Rock-Dust Samples

Sample No.	Time, Hr.	Moisture, Per Cent	Ash, Per Cent	CO ₂ , Per Cent	Total Non- Combustible, Per Cent	Minus 20-Mesh, Per Cent	Minus 200-Mesh, Per Cent
276 (Floor).....	24*	8.66	16.88	0.79	26.33	29.50	9.50
380 (Band).....	168	2.78	48.31	31.04	82.13	87.10	16.13
495 (Band).....	168	2.56	43.15	27.08	72.79	89.22	14.71
520 (Band).....	168	3.17	49.07	32.44	84.68	97.47	17.72
781 (Band).....	72	3.05	44.96	29.21	77.22	78.20	26.92
783 (Band).....	48	8.21	41.98	25.85	76.04	21.17	5.86
820 (Floor).....	48*	3.17	28.32	1.62	33.11	90.00	15.00
902 (Floor).....	24*	8.98	16.75	0.91	26.64	37.30	9.29

*The floor samples (276, 820 and 902) were obviously too low in rock dust at time of sampling. Additional coatings were later applied to provide 65% incombustible.



SEALED TANK is charged with compressed air at 100 psi to agitate and discharge rock-dust slurry through high-pressure hose.



FLAT-JET NOZZLE has wear-resistant insert on impinging surface.

its handle comes down over the locking lever. In other words, the pressure-relief valve must be open before the locking lever can be raised to open the top cover.

In using the unit the operator opens the cover and turns on the water to fill up the tank to a predetermined 30-gal level marked on the inside wall. He then feeds into the 30 gal of water 10 bags (500 lb) of rock dust at a measured rate. During this operation the air-inlet valve is cracked open to provide the air necessary for agitation of the mixture. With the batch in the tank, the cover is closed and locked by the pressure-relief valve, as previously mentioned, and the air-inlet valve is fully opened.

The full pressure in the tank now forces the mixture through the material-discharge hose. The actual discharge is controlled by the operator from a valve at the nozzle, a brass flat-jet unit obtained from Spraying Systems Co. A rubber insert is bonded to the impinging face of the nozzle where the flat jet is formed to protect this surface from rapid wear by the high solids content of the stream. The design of the impinging surface is such that the stream is 3 ft wide at a point 5 ft from the nozzle.

As much as 600 ft of high-pressure 1-in discharge hose has been used, although the normal range is from 300 to 400 ft. The 50-ft lengths are connected through Duro Quiklock couplings.

One batch of the mixture is sufficient to rock-dust seven or eight 8½-ft cuts on floor, roof and ribs, and a single batch may be discharged through the hose in about 10 min. The rock-dusting unit now is being used in a development section consisting of five 14-ft

headings driven on 70-ft centers. Panel recovery at Mine No. 17 includes driving rooms six at a time 26 ft wide and 300 ft deep, leaving solid 70-ft pillars between sets of six rooms. It is felt that such a set of six rooms may be served from two setups of the wet rock-dusting equipment, which is towed into position by a shuttle car.

A mining unit at No. 17, similar to those at other Peabody mines in the Illinois No. 6 seam, includes a Joy 11-BU loading machine, a 10-RU cutting machine, two 10-SC shuttle cars, a twin-boom drill wagon equipped with Dooley Model 580 coal drills and a similar unit with rock gears in the drills for roof bolting. Airdox is used for on-shift coal-breaking. A section crew is made up of 21 men. One of the chief advantages of wet rock-dusting is that the mixture can be applied up close to the face while the production machines are actually at work, and the operator need only walk back out of the way with the discharge hose to give the right-of-way to face traffic.

The apparatus now in use is a product of step-by-step development. The earliest designs included a pair of 55-gal drums linked through a solids pump which agitated the mixture by passing it back and forth between the drums. A similar pump was employed to discharge the mixture through the hose. But the pump impellers and casings were rapidly worn away by the solids, sometimes becoming unusable after handling 10 bags of rock dust. An agitator from a washing machine also was tried in the mixing operation, but while this gave good service, the problem of pumping the mixture through the discharge hose still was critical.

When the possibilities of using com-

pressed air first were investigated, it was thought that compressed air from the Airdox lines might be used with a reducing valve, but a suitable valve could not be found. Several materials, including hard-metal facings, were tried as linings for the impinging surface of the nozzle before the rubber insert finally was found.

Future models may be modified to the extent of using a conical top section to accommodate an inside-closing door that will insure a positive lock when the tank is charged at full pressure.

Development work was in charge of Joe Craggs, field superintendent; the mechanical design was done by Keith McCann, assistant field superintendent; and mine testing and evaluation was done under the supervision of L. H. Johnson, safety engineer, all with headquarters at Peabody's Taylorville, Ill., operating offices. Mine officials at No. 17, who co-ordinated the new element in the cycle, are Tony Shimkus, mine superintendent, and William Hatfield, mine manager.

These officials were concerned in the early stages of the work with the effects the water might have on the applied rock dust, but analyses of floor and band samples of both wet and dry applications indicate that after a relatively short period of time there is little difference in the moisture content of the coatings. Furthermore, the total incombustible content of the wet-applied coatings is satisfactory with respect to the 65% minimum required by the Federal Mine Safety Code. The table shows results of the laboratory analyses of the samples, including the elapsed time between application and sampling. All determinations are on an "as received" basis.

The Search for Better Frame-Grounding Methods

Here is a down-to-earth review of (1) the problems of frame-grounding underground units powered through trailing cables, (2) some possible solutions as embodied in systems now undergoing tests and (3) the challenge to coal's electrical fraternity to devise still better systems.

By L. H. HARRISON, Mining-Electrical Engineer
U. S. Bureau of Mines, Birmingham, Ala.

The Background . . .

THE REQUIREMENT FOR GROUNDING the frames of electrical equipment in coal-mining service has been a controversial issue since passage of the Federal Coal Mine Inspection Act in 1941. Most people who were familiar with the hazards of operating ungrounded electrical equipment readily conceded the necessity for some form of protection, but many objected to the method used.

As all mining people probably know, the method of frame-grounding required by the Coal Mine Inspection Division of the Bureau of Mines necessitated the use of a grounding conductor in addition to the normal number of power conductors required for the particular power system used. Generally, this grounding conductor was made up as an integral part of the trailing cable. Considerable trouble has been experienced because of introduction of the third conductor into the trailing cable. Offhand, it would appear that such cables could be manufactured to meet the rugged requirements of coal-mine service; however, certain circumstances have to date prevented realization of the industry's hopes in this direction. Some of these will be considered here.

First, it is desirable, and in many cases necessary, that the diameter of the cable be held to a minimum. This applies particularly where the cables are wound on reels, as the diameter of the cable is a limiting factor in the storage of cable on the reel. It is well known that the users of mining-machine cables have limited the conductor sizes of such cables to values below the normal current-carrying capacities required for some machines. This was the situation with which the cable manufacturers were confronted when it became necessary to add the extra grounding conductor to the trailing cables for coal-mine service.

To provide a two-conductor cable with a grounding conductor of a size suitable to meet the Bureau requirements, without increasing the over-all dimensions appreciably, the idea of inserting a flat conducting strip between the power conductors was evolved. This construction became very popular and was largely used by the various manufacturers. On direct-current systems, the negative conductor and the grounding conductor were both connected to the mine track, and in many instances this type of cable construction had the effect of reducing the cable insulation 50%. This has been a contributing factor in the troubles experienced with trailing cables.

Adapted from a paper presented at the 1954 meeting of the Coal-Mining Section, National Safety Council.

Another cause of considerable trouble has been the difficulty in splicing such cables so that the tension is distributed equally on the three conductors. Temporary splices in a coal mine are necessarily made under unfavorable circumstances. There has been a tendency to make splices in which the tension is largely on the grounding conductor, with the almost inevitable result that it separates later, or, to save time and effort, the grounding conductor has often been clipped at both ends of the splice, leaving the grounding circuit to the machine open and ineffective.

There have been many objections to the use of a grounding conductor, and some of them must be recognized as legitimate and well founded. Finally, it appeared that the added original cost and increased maintenance cost involved in the use of cables with grounding conductors were not justified by the results obtained, and an appeal was made to the Bureau to eliminate this requirement of the Federal Mine Safety Code. The record of accidents due to failure to ground electrical equipment properly and the known ignition hazard presented by the transfer of electric current between the frames of machinery operating near the faces precluded the possibility of permanently eliminating the requirement for some form of protection against insulation failures on electrical equipment. Accordingly, the Bureau determined to conduct a program of research and investigation into the possibility of providing an equivalent or improved method of protection that would be more acceptable to the industry.

The Problem . . .

To the average person familiar with the basic requirements involved, it would appear not too difficult to provide a suitable and acceptable method of protection. As a matter of fact, over the period of years during which the Federal Coal Mine Safety Code has been in effect, many people have suggested schemes purported to be superior in performance and less expensive than the method advocated by the Bureau. Nevertheless, in spite of the fact that the matter has been given considerable publicity in the industry and suggestions have been requested, there has been no great influx of practical and effective ideas.

An acceptable grounding device should meet the following basic requirements:

- It should provide reliable and effective protection from shock hazard in case of insulation failure.
- It should provide reliable and effective protection against ignition hazards due to transfer of electric currents between the frames of equipment operating near the working faces.
- It should provide reliable and effective protection against shock hazard due to possible differences of poten-

tial between the frames of adjacent equipment or equipment and ground.

- It should be simple, rugged, economical, and practical.

- It should be applicable to all types of equipment and power supply circuits.

The accepted method of protection, using a grounding conductor in the trailing cable, will, under normal operating conditions, provide adequate protection when properly maintained. It does so mainly because the grounding conductor, in direct-current operation at least, connects the frame of the equipment to the bonded track, which is part of the power circuit. Thus, when an insulation fault occurs or when the frame is energized for any reason, a short circuit is established through the frame and the grounding conductor to the track and a fuse or circuit breaker at the outby end of the cable functions to open the circuit. To provide equivalent protection without using the additional conductor, the negative conductor must be utilized as the grounding medium. To do so, the feedback of voltage from the conductor to the frame must be prevented under all fault conditions that might occur. In nearly all the schemes suggested, this is accomplished by using plate-type rectifiers or vacuum tubes.

The grounding-conductor method has not been satisfactory on alternating-current systems, except where the system is wye-connected and a grounding neutral established. The connection of the grounding conductor to unbonded track, pipe lines and grounding electrodes when ungrounded delta power systems are used does not provide reliable protection from shock hazard.

Proposed Alternatives . . .

The Polarized Relay—As long ago as 1946, a scheme of ground-fault protection for shuttle cars was developed, utilizing a small relay polarized by means of a selenium rectifier. In this scheme, the relay coil was connected to the frame of the machine and to the negative conductor through the polarizing rectifier. The relay contacts were connected in the circuit of the main contactor coil on the shuttle car, and when the machine frame became energized, for any reason, the relay functioned to open the main contactor and thus prevented operation of the equipment until the hazard was removed.

It was recognized that this scheme had merit; however, a considerable portion of the wiring on a shuttle car is connected outby the main contactor. Because of this, the frame of the machine could be energized from an insulation fault outby the contactor, in which event the device might function properly yet fail to de-energize the frame and remove the hazard. For this reason, the method was considered inadequate and was not accepted by the Bureau of Mines as a substitute for the grounding conductor.

In the years following, with conditions in the industry changing rapidly, the need for a better method of frame-ground protection became increasingly apparent. Finally (November, 1953) it was decided to waive the requirement for grounding the frames of mobile equipment in underground coal mines until a satisfactory method of providing equivalent ground protection could be devised. Under the circumstances, it was thought advisable to reconsider the possibilities of the polarized relay scheme, and accordingly a device of this kind was constructed and sent to the Pittsburgh Central Experiment Station where various tests were made and a report covering these tests submitted. The original polarized relay is shown in Fig. 1.

In the meantime the National Mine Service Co., of Beckley, W. Va., had become interested in the possibilities of this device, and representatives of the company

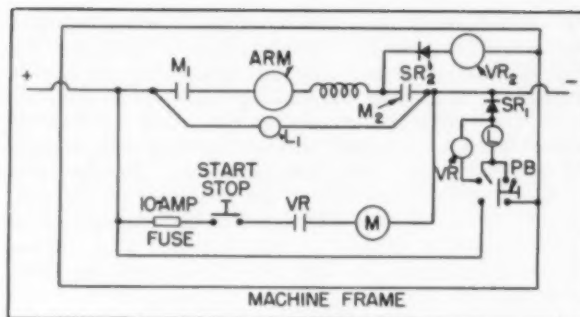


FIG. 1—Polarized-relay ground-fault protection.

submitted a scheme incorporating the idea of the polarized relay (shown diagrammatically in Fig. 2).

The device, as originally set up by the National Mine Service Co., consisted of a relay designed to pick up at a potential of 60 v. The coil of this relay was connected to the center point of two selenium rectifiers, which were connected across the machine circuit. The contacts of this relay were connected in series with the operating coil of the main contactor on the machine to be protected. When approximately 60 v is induced on the frame of the machine, enough current flows through the relay coil and one of the rectifiers to cause the relay to pick up and open its contacts, thereby opening the main contactor on the shuttle car. A reset coil and contact are provided to reset the relay after it has opened.

Both of the foregoing are different arrangements of the polarized-relay scheme. The arrangement in Fig. 1 has a relay coil VR_2 connected through a polarizing rectifier between the frame and the negative conductor. It may be noted that a portion of the wiring is not de-energized by opening the main contactor. The amount of such wiring and accessory equipment might be reduced and this is being investigated.

The arrangement shown in Fig. 2 is very similar to the

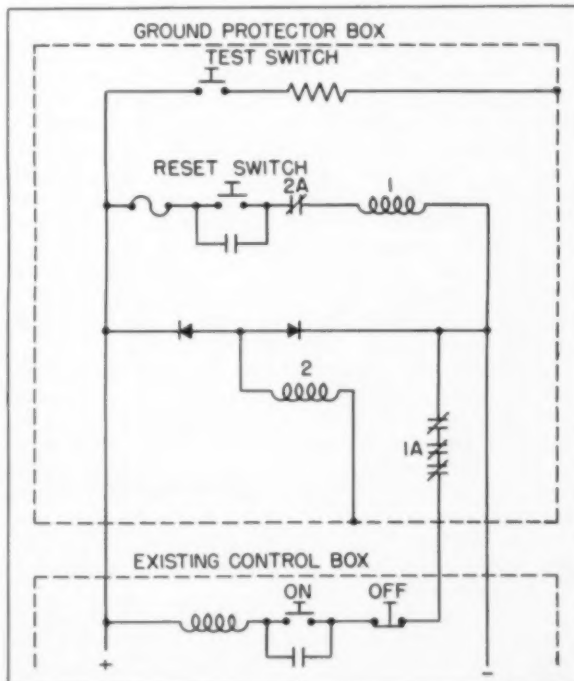


FIG. 2—An alternate polarized-relay protective scheme.

first scheme, except that selenium rectifiers are arranged to form a neutral point for the connection of the relay coil. This eliminates the necessity for considering polarity in splicing or connecting the trailing cable. With both arrangements there is a possibility that small amounts of current will be transferred between the frames of contacting equipment. However, the amount of this current is greatly minimized because of the resistance of the path through the relay coil. The ignition hazard involved in transferring such minute currents between large masses of metal is a point for consideration in evolving these methods.

The Polarized Short-Circuiting Device—In view of the fact that complete protection from shock hazard virtually demands that power be removed from the circuit at the outby end of the cable, a new and different approach to the problem appeared necessary. The established method, using the grounding conductor, when properly maintained provided excellent protection from shock hazard. This is true not because of the low-resistance earth contact afforded by the mine track but because this track presented a low-resistance path for the re-entry of fault current into the power system. When a fault appeared in the circuit insulation raising the frame-to-ground potential, a short circuit was established through the fault, the frame and the grounding conductor.

The maximum voltage that can appear on the frame of the machine under these circumstances equals the voltage drop in the grounding conductor, which thus has a limiting effect on the shock potential. At the same time, if the resistance of the fault circuit is low enough to allow a large flow of current, the fuse or circuit breaker will open, de-energizing the circuit. Thus the fault is cleared at the fuse nip or circuit breaker.

In view of the established practice of clearing ground faults by opening the protective device by short-circuiting current in the faulted circuit, it appeared logical to consider the establishment of such short circuits by means of a device located on the machine to be protected. Accordingly a series of preliminary tests was conducted at Pittsburgh which indicated the validity of the theory on which the tests were based.

The tests at Pittsburgh were confined to low current values because of the limited capacities of the direct-current generating units installed at the station, and to carry the tests further it was necessary to construct a short-circuiting device for experimental use in a coal mine.

Such a device was constructed at the Birmingham, Ala., station with the co-operation and assistance of various mining companies in that district. The Bureau of Mines then granted permission for installation of this device in a nongassy coal mine, and the device was installed in the circuit of a Goodman standard shortwall mining machine operating in the Black Diamond mine of the Black Diamond Coal Mining Co., Jefferson County, Ala.

The device, as constructed for the first experimental trials at Black Diamond mine, consisted of a contactor having a balanced armature with a shunt pickup coil designed for operation at about 25 v DC and a series holding coil. The contacts were an alloy known as silver graph-alloy and were approximately $\frac{11}{16}$ in in diameter. The contactor was used in conjunction with two small selenium rectifiers for polarizing the shunt coil. The schematic wiring arrangement for this equipment is shown in Fig. 3. It functions as follows:

The selenium rectifiers were connected across the circuit as shown. The shunt pickup coil was connected to the center point between the rectifiers and to the machine frame. The series coil and contacts were connected directly across the power circuit. When, for any reason, a

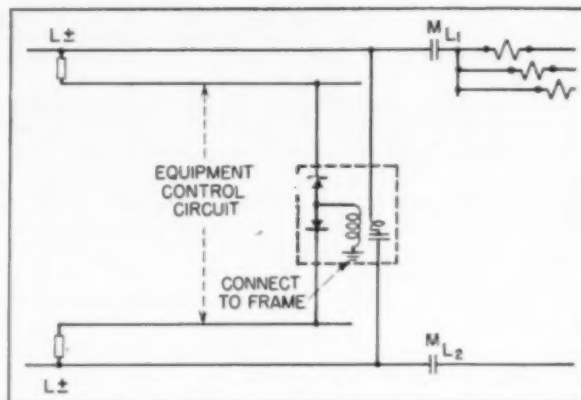


FIG. 3—Protective method using short-circuiter.

voltage appeared between the frame of the machine and ground, a current flowed through the shunt coil and one set of rectifiers to the grounded side of the circuit. When this voltage reached a value of 25 or more, enough current flowed in the shunt-coil circuit to close the contacts of the device. Immediately, a short circuit was established through the series coil and the contacts, and a de-ion circuit breaker at the outby end of the cable was tripped to de-energize the circuit. The voltage across the shunt coil is reduced virtually to zero as soon as the contacts close, and providing a coil that will pick up on low voltages and yet not burn out on full-line voltage presents no problem as it does in other devices.

After numerous tests and service operations over a period of several months, the device appeared to be practical and effective in every way, and a smaller and simpler version of the contactor was designed and built. The construction of this device is shown in Fig. 4. This new device is enclosed in a metal box for mounting directly on the mining-machine frame. A small magnet is mounted at the contact end to prevent closing from impact. The necessity for carrying on this experimental work in a nongassy mine has virtually confined the work to one mine in the Birmingham district, and completion of the work has been delayed because of poor working schedules.

It appeared desirable to eliminate the necessity of considering polarity when splicing trailing cables, and the rectifiers were connected back-to-back across the full-line voltage for this purpose. This made it also necessary to determine if small selenium rectifiers could be connected across the line for an indefinite period without breaking down. This has been reasonably well established in actual service, and no undue trouble is anticipated from this source. The other major question involved the service life of the contacts. This, too, has been determined. The contacts used on these experimental contactors have already initiated more short circuits than would be experienced in normal operation over a number of years with the greater portion of their service life still remaining.

The ignition hazard due to the transfer of current between the frames of contacting equipment is minimized, as it is in the polarized relay scheme, by the resistance of the path through the relay coil. The relative hazard is about the same for both the polarized-relay method and the short-circuiting method. In either case, the arc potential between frames is greatly minimized in comparison to that existing with the grounding-conductor method.

The idea of deliberately creating a short circuit in a coal mine is rather hard to get used to. However, the

FIG. 4—Layout of an improved short-circuiting device (right) developed after tests in an Alabama mine.

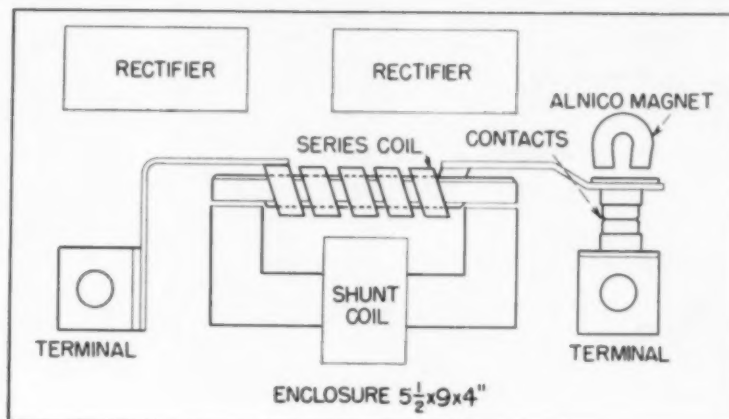
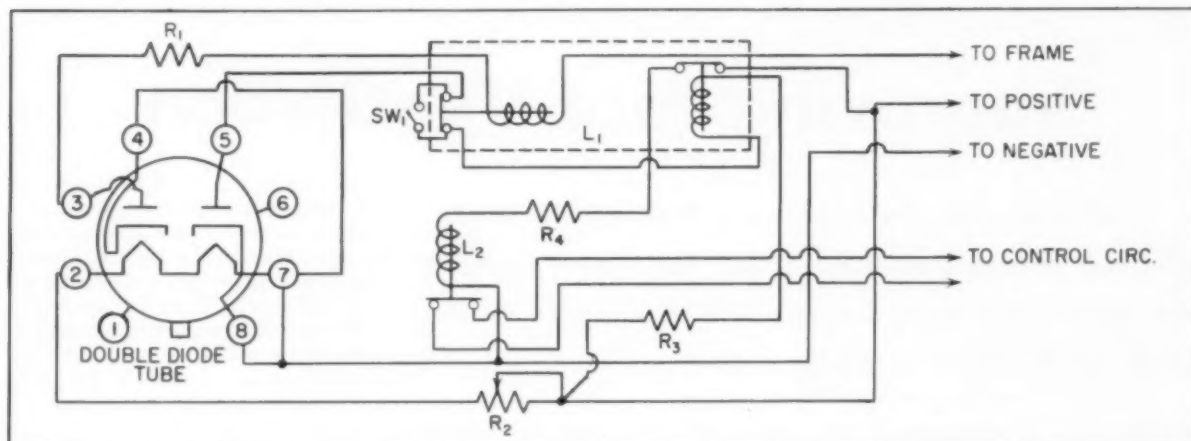


FIG. 5—Schematic diagram of electronic device (below) which has been tried on a shuttle car in a Kentucky mine with favorable results.



solid short circuit established by a contactor of this type virtually eliminates the arcing which we naturally associate with a short circuit. This is an advantage over the present method where high-resistance short circuits maintain destructive arcing at times.

The possibility of flashover on conversion units due to the solid short circuit is greatly minimized by the use of a high-speed circuit breaker, and trouble of this kind has not been experienced, even when the short circuit is established very close to the source.

Electronic Devices—It was inevitable that a solution for the problem should be sought in the field of electronics, and several devices have been proposed. One such device, developed in the Vincennes, Ind., district, has been tried in service on a shuttle car in a Kentucky mine with favorable results. A diagram of the device is shown in Fig. 5.

This device consists of a small vacuum tube of the double-diode type. One plate is connected through a resistor and relay coil to the machine frame. The other plate is connected through the contacts of this relay, the coil of a holding relay and a resistor. The filament of the tube is continuously energized. A voltage impressed on the frame of the machine will cause the plate to become positive with respect to the cathode, and current will flow in the relay circuit, causing the device to function and open the circuit. This device has been used only with shuttle cars, and it opens the main contactor upon the occurrence of a ground fault. Functioning in this manner, it does not de-energize all wiring on the equipment. Operation of the equipment protected also depends upon the tube filament and several small relays and resistors. The tube prevents the feedback of voltage from the

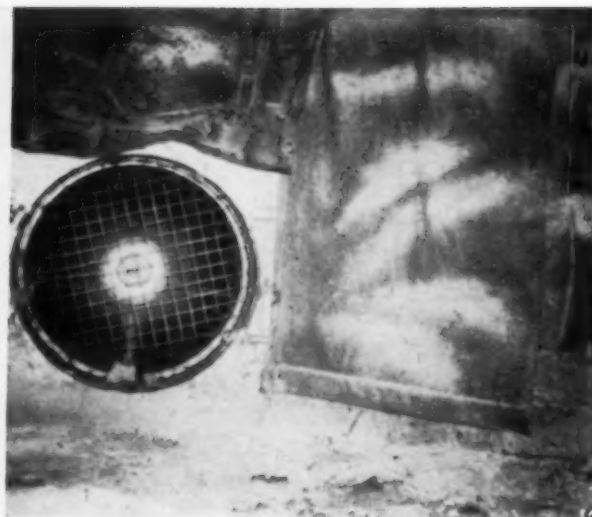
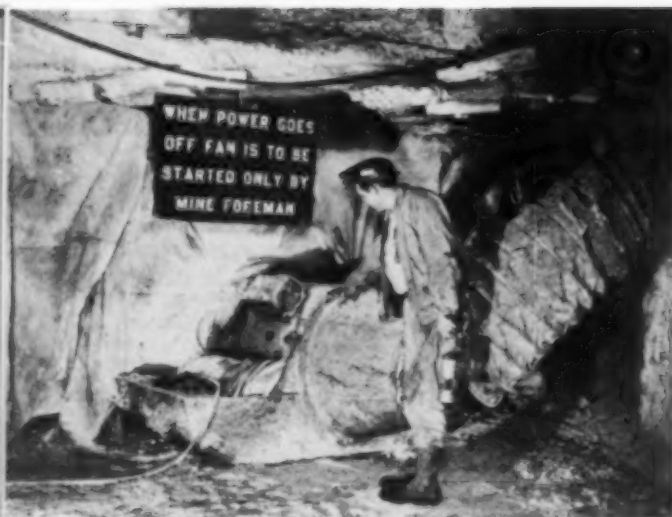
negative conductor to the frame, and the transfer of current between frames would be virtually eliminated except for the very remote possibility of undetected faults on the grounded side of two machine circuits.

Another electronic scheme proposed, for use on alternating current only, utilizes circuits through the earth to provide the tripping impulse. This circuit appears to be theoretically sound. However, the experience of a large chemical company in New Mexico with a similar scheme indicates that circuits through the earth require constant adjustment to prevent unnecessary tripping when faults are not present. It is questionable if this scheme would be suitable for underground mines.

At this writing, some work had been done on a method that involves tripping a circuit breaker remote from a mobile machine by means of an alternating voltage superimposed on the direct-current circuit from the machine to the circuit breaker. Tests made to date indicate the possibility of developing a simple and practical method, but the tests have not been carried far enough as yet to provide a basis for definite conclusions.

The Challenge . . .

The problem of providing ground-fault protection and protection against ignition hazards from contacting equipment for mobile and stationary machines is not an easy one. As yet there does not appear to be any method that combines all of the desirable features of an ideal system. It is to be hoped, however, that eventually a system, or systems, will be evolved which, though something less than ideal, will provide a larger measure of protection and acceptability than the present method.



AUXILIARY FAN has electrical components on intake side of brattice. Mine Foreman Eugene Downer (above) is responsible for proper operation. Counterweighted by-pass flap in check brattice (right photo) prevents air recirculation.

Improving Face Ventilation

A 3-ft auxiliary exhaust fan at Warwick No. 2 mine provides greater quantities of air, improved visibility and wider clearances for effective cleanup in entries being developed by continuous mining.

ANOTHER IDEA contributing to improved face conditions, namely, an auxiliary exhaust fan moving ventilating air past the faces of continuous-mining places, is in use at Warwick No. 2 mine, Duquesne Light Co., Greensboro, Pa., where the idea of attaching roof drills to the sides of continuous miners for in-cycle roof bolting also was born (see *Coal Age*, April, 1954, p 102). The fan, installed in the face breakthrough in developing entries, withdraws air from the active face through tubing 2 ft in diameter, thus eliminating a need for line brattices and providing more air, better visibility and wider clearances.

But don't rush out to buy an auxiliary fan for your operations until you get the facts. Duquesne Light's installation is a closely controlled setup, permitted only after exhaustive study by a commission of Pennsylvania mine inspectors and representatives of the Bureau of Mines. Furthermore, the fan must be operated in compliance with conditions set forth by the Joint Industry Safety Committee.

THE PROBLEM AT WARWICK

As explained by J. E. Elkin, general superintendent of Duquesne Light's coal-producing operations, the problem of providing adequate ventilation at the face is a big one, considering the amount of dust produced by the

ripper bar and roof drills and the large quantities of heat which must be carried away from the 177-hp miner with its heated hydraulic oil.

It was found that a well-constructed line brattice would provide fair ventilation for a distance of about 100 ft, but beyond this point the volume passing the face fell off rapidly. Still other shortcomings in the use of line brattices with continuous mining are:

1. Hurried installation, necessitated by the rapid advance, often results in a poor job with high leakage.
2. High places caused by falls are difficult and time-consuming to seal.
3. Check curtains in line brattices crossing shuttle-car routes are difficult to maintain.
4. Line brattices interfere with proper rockdusting and cleanup of fine coal.
5. Repair and maintenance of the brattice consumes much of the time of the production crew if even a minimum volume of air is to reach the face.
6. When the line brattice is tight enough to conduct a reasonable volume to the face, it often acts as a regulator, seriously reducing the total volume of air on the split.

Recognizing the objections to the use of booster fans, mining officials of

Duquesne Light after studying the problem came to the conclusion that the objections applied more to blower fans than to properly-installed exhaust fans. The possibilities of recirculating methane-bearing air from the face and of blowing a methane-air mixture past the fan motor are the big problems with poorly-installed blowing fans.

IMPROVING FACE VENTILATION

After a period of experimentation and testing, a design was drawn up to include a 3-ft propeller-type fan with an explosion-proof 7½-hp drive motor. The fan is driven by the motor through three static-resistant ¾-in V-belts. The fan and motor are mounted as a unit on a skid base to permit rapid relocation as mining advances. The unit is hauled about by a shuttle car, as is an auxiliary skid-mounted control center consisting of a safety circuit center and an automatic motor starter.

The controls include a starting switch mounted directly on the fan motor, and, in the auxiliary unit, the circuit center is designed to interrupt power in the event of an overload in the motor or a 20-amp ground in the trailing cable or motor frame and the motor starter is equipped with a circuit breaker which must be reset manually in the event of a power failure. Thus if the fan stops it will not resume operating when the power returns. This provision permits an authorized official to examine the face before restarting the fan.

As mentioned, the fan is installed in the last open breakthrough where it operates through a canvas brattice with all electrical components on the intake side of the brattice and only the exhaust stack on the return side. A por-



VISIBILITY is improved as dust and mist are withdrawn through tubing, but prime objective is greater quantity of air at face.

tion of this check brattice consists of a free flap which serves as a by-pass to permit free circulation of air in excess of that moved by the fan. With this by-pass provided in the brattice, the fan serves only to insure an adequate volume of air at the immediate face and does not otherwise interfere with normal coursing of air through the split, and the air by-passing the fan is insurance against recirculation.

Ventilation surveys made in the area served by the fan show that from 4,000 to 4,500 cfm may be exhausted from the face through 250 ft of tubing. This is sufficient to provide the men with fresh air, to adequately dilute possible concentrations of methane and to remove from the immediate face area the dust, mist and heat produced by the operations. Line brattices, on the other hand, come nowhere near matching this performance.

SAFETY PRECAUTIONS

The operation of the fan is governed by stringent rules. For example, it must not be used in other than room and entry development work, and use of the fan does not relieve management of any of its dust-suppression responsibilities.

The fan and tubing must be inspected at the beginning of each shift and at 3-hr intervals thereafter; tubing is thoroughly dedusted before being returned to use; rock dust and fire extinguishers are near at hand, and rock dust is frequently distributed near the fan exhaust to dilute any possible coal-dust accumulations that may occur in the return.

The 6-ft sections of tubing are added as needed by the roof-bolter working along the side of the entry opposite the continuous-miner operator. A quantity of rock dust is placed in each section of tubing as it is added to the line as another step in controlling the coal dust as it passes through the tubing.

The intake end of the tubing is kept as close as possible to the face, and tests with smoke tubes have shown a pronounced movement of air across the faces of the 16-ft-wide places and into the tubing. As shown in an accompanying illustration, the tubing is suspended from a messenger wire nailed to the wood bearing plates on the rib row of roof bolts. The flexible tubing is reinforced by a steel helix.

STANDARD DEVELOPMENT

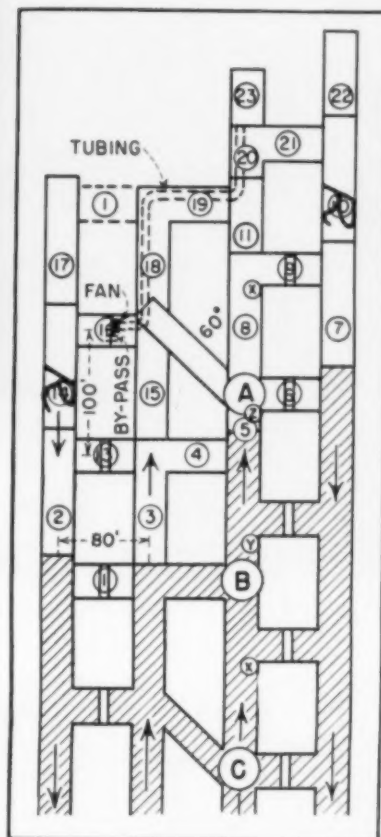
Standard operating procedures, formulated through the joint efforts of Duquesne Light's operating and engineering departments, are followed in both development and retreat work. As shown in the accompanying diagram, entries are advanced by making 23 drives in the sequence shown by the circled numbers. Service operations, such as moving up the shuttle-car discharge station and the machine nips, also are written into the standard plan.

Intake air enters the two center headings and the two outside headings are returns with regulators outby the face breakthroughs. There are no canvas check curtains across shuttle-car routes.

The auxiliary exhaust fan is moved up as each new breakthrough between Headings 1 and 2 and the advance drive in Heading 1 are completed.

The crew of such a development unit includes operators for the continuous-mining machine, the pickup loading machine and the shuttle car, two roof-bolters, a mechanic and an assistant foreman. The steel mine cars are spotted at the discharge station by a robot locomotive. The men working in the immediate face area agree that the fan has made a marked improvement in face conditions.

The fan operates only during actual operations. It is shut down while shifts are changing and at all other times



Standard development procedures at Warwick No. 2 mine . . .

LEGEND:

- A, B—Shuttle-car dumping points
- x, y, z—Continuous-miner nips
- 1, 2, etc.—Numbers indicate sequence of drives

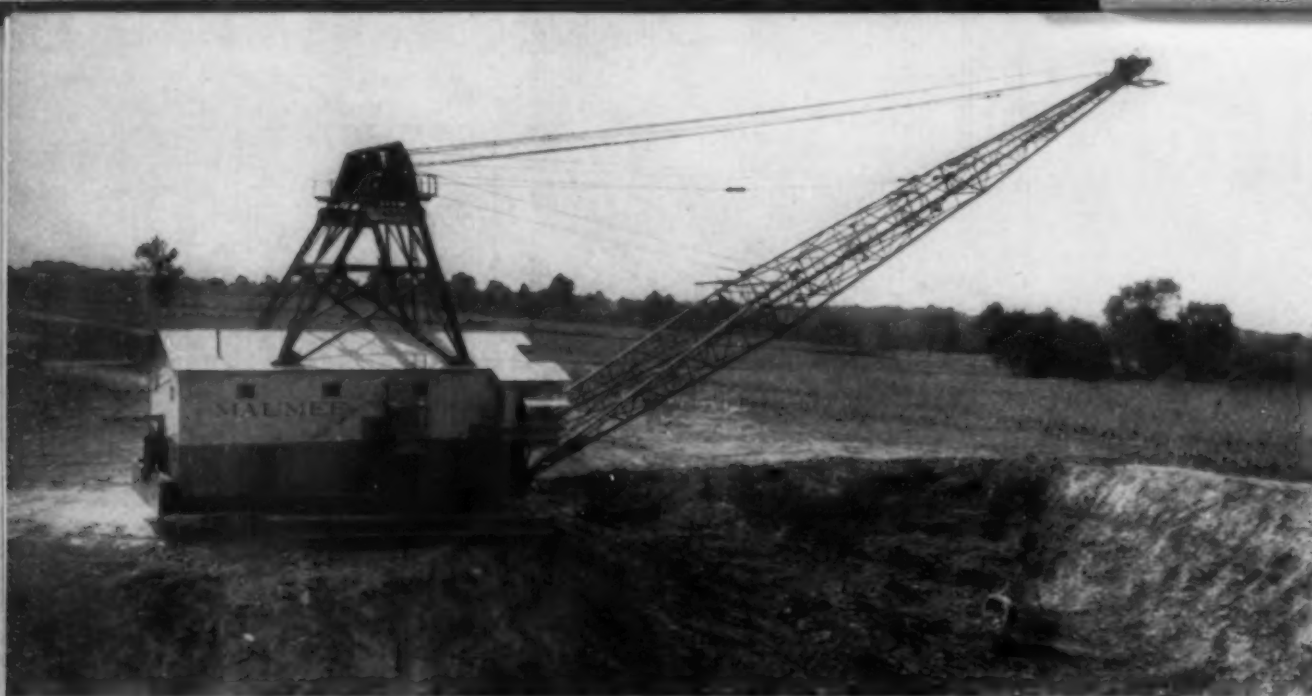
DRIVE NO. INSTRUCTIONS

- 1 Prepare to move from A to B. Move as soon as practicable.
- 5 Move nips from x to y.
- 13 to 15 Prepare to move B to A.
- 16 Move nips y to z.
- 16 Move S. C. dump B to A.
- 20 Move nips from z to x.

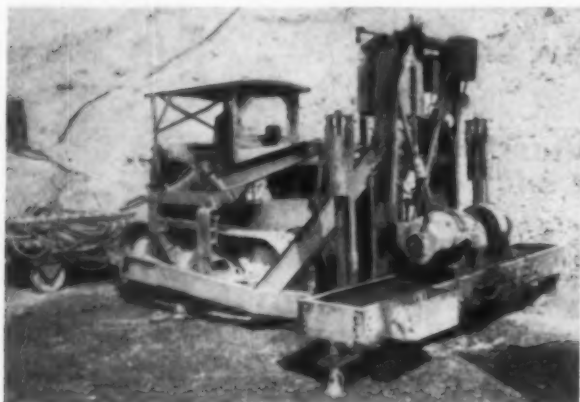
TIMBERING—Before leaving any place, bolt up to outby rib of breakthrough. Post any faces not bolted.

VENTILATION—Regulators shall be kept in outside entries, just outside last open breakthrough. Shuttle car should not travel through any canvas.

when a certified official is not in the section. It has been found, however, that with the fan idle a quantity of about 1,000 cfm flows through more than 200 ft of tubing to keep the idle face free of methane. The remainder of the air in the section passes through the by-pass flap in the fan brattice.



DRAGLINE works on rock base laid on top of shot bank. Unit is shown starting new cut that will expose 75-ft-wide strip of Upper Brazil Block coal.



CRAWLER-MOUNTED horizontal hydraulic drill was built in company shop. Unit tows auger sections and power cable.



DRILL CONTROLS (arrows) are mounted where operator can regulate unit easily while observing drilling.

Company-Designed Unit Bores Horizontal Blastholes



AUGER GUIDE (arrow) is used to steady and support first 6½-ft auger section as it enters the highwall.



DRILLING horizontal holes 30-in above the coal is no problem on sloping ground. Levelling jacks have 4-ft travel.



COAL LOADING is handled by 2½-yd electric shovel. Coal nearest highwall is loaded first, leaving solid strip for trucks to travel on. Layer of clay underlying coal is recovered and shipped.

Stripping 30-In Coal Efficiently

Recovering 1,800 tpd from a thin seam requires effective supervision. Skillful blasting and proper coal cleaning in the pit keynote operations at Maumee's Old Glory No. 33.

CONTINUING FAITH in the future of the coal industry is reflected in the development of the new Old Glory No. 33 strip mine of the Maumee Collieries Co., Terre Haute, Ind. Located 1 mi south of Coal City, Owen County, Ind., Old Glory No. 33 is geared to produce 1,800 tpd from the 30-in Upper Brazil Block seam. The new development replaces tonnage from the depleted Old Glory No. 17 mine which had produced coal for 30 yr. Coal is processed in the company-designed all-steel plant featuring flexibility in sizing and loading.

The coal seam is free of impurities and stripping methods are designed to prevent contamination in the pit. By exercising care in blasting, thoroughly cleaning the coal before loading and closely supervising loading in the pit, Maumee is able to produce a quality product without elaborate washing and drying facilities.

Cashing in on every opportunity to add to company income, Maumee recovers a 12- to 14-in layer of fireclay which is loaded and shipped to the

refractory industries in the Midwest where it is used to make brick, terracotta pipe, plastic clay and other products. Loose coal remaining along the edges of the strip pit after the power shovel has completed loading is handloaded by an independent contractor who hauls it to the tippie.

PREPARING THE OVERBURDEN

Overburden ranges from 30 to 45 ft in thickness and includes 10 ft of dirt, 10 ft of sandstone and a variable thickness of shale. To handle the drilling job at the new pit, Maumee built a crawler-mounted adjustable hydraulic horizontal drill. Essential parts of the unit are: (1) an Allis-Chalmers tractor with modified hydraulically controlled arms for supporting the drill; (2) two hydraulic levelling jacks for controlling direction of drilling; (3) a 6-in-diameter hydraulic feed jack; (4) a 20-hp 440-v 1,700-rpm drill-rotation motor; (5) a 13:1 speed reducer between the rotation motor and the auger chuck; (6) a 3-hp hydraulic pump motor; and (7) a

hydraulic control system for controlling the various movements.

The drill is trammed to a position parallel to the highwall and the drilling assembly is lowered to the floor of the pit. Then the drilling carriage is raised and levelled by means of the two hydraulic levelling jacks attached to the ends of the carriage frame. The carriage is wheel-mounted and travels back and forth in the frame which also contains the feed jack. The feed has a 6½-ft travel and 6-ft Parmanco augers are used. Two men operate the unit and drill an average of 75 ft of 6-in-diameter hole per hour.

Blastholes are drilled on 20-ft centers 30 in above the top of the coal and to a depth of 75 ft. To prevent shattering of the coal and contamination with fine dirt the holes are detonated in groups of three. A 30-ft space is left between each group of three holes to prevent propagation of the shot to the next group. The hole nearest the shot bank is detonated with two No. 6 detonators, the second hole with one cap and the third with a delay. Holes are charged with 550 lb of explosives.

When a new cut is started, a fourth hole is needed to provide good fragmentation of the sandstone. This hole is drilled above the first horizontal hole and is angled upward so that it is about 25 ft above the top of the coal at the back of the coal. It is charged with 200 lb of explosives.



PRIMARY SIZING into plus 6-in and 6x0 sizes is handled by grizzly and 6x16-ft vibrator.



HEATED SCREEN equipped with stainless-steel cloth provides better sizing of $\frac{1}{4}$ x0 into $\frac{1}{4}$ x $\frac{1}{8}$ and $\frac{1}{8}$ x0.

Flexibility Is Keynote of Preparation Plant



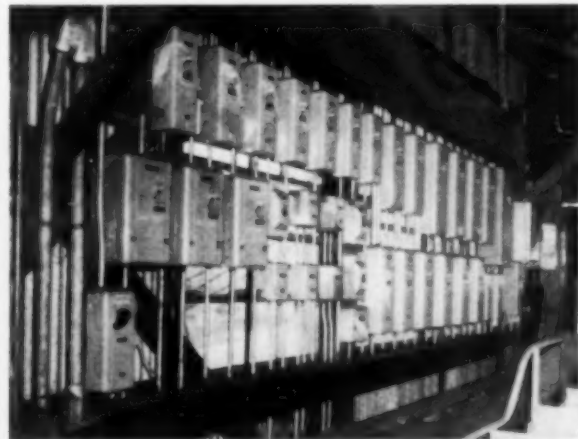
MIXING CONVEYOR spans loading tracks at end of booms, permitting larger sizes to be crushed and rescreened.



LOADING CONTROL is centered in glass-enclosed room where operator has full view of all tracks.



SKID-MOUNTED junction boxes and transformers are located at top of highwall. Cables are extended every 1,000 ft.



OVERLOAD PROTECTION for individual plant units is grouped in central location for easy inspection.



PREPARATION FACILITIES are housed in all-steel building. Flexibility permits simultaneous loading of five different sizes. Crushing and rescreening are handled in separate section.

UNCOVERING THE COAL

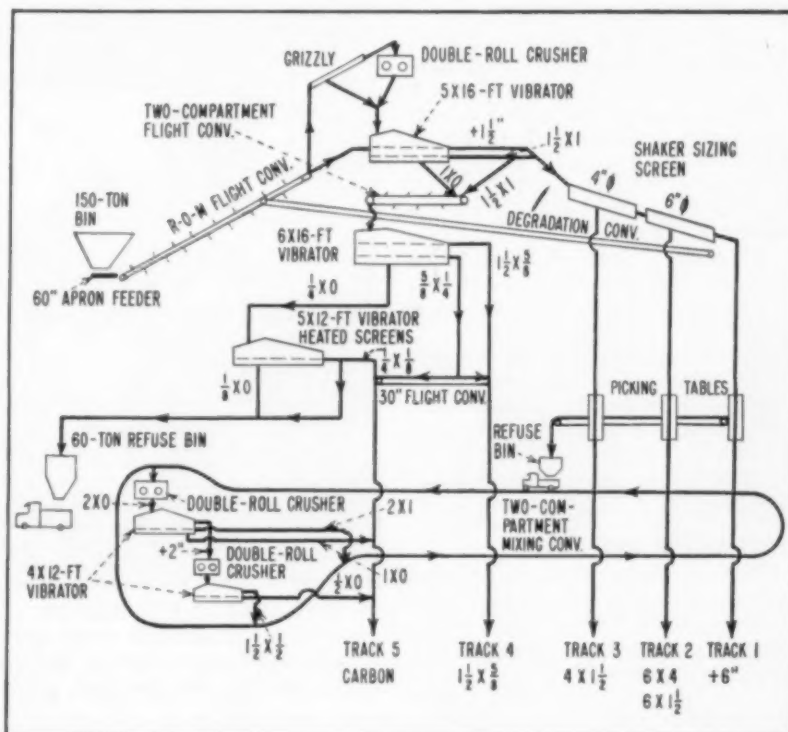
A Bucyrus 10W walking dragline, equipped with a 13-yd bucket, handles the stripping job. Operating two shifts per day and six days per week, the drag works on a rock base on top of the shot bank. The drag distributes material for the base as it uncovers the coal, and final smoothing of the material for the base is handled by one of the three Allis-Chalmers bulldozers. After the overburden is removed, the top of the coal is cleaned by a bulldozer.

LOADING COAL AND CLAY

The coal is weakened when the overburden is shot and can be loaded readily without being shot. Coal loading is handled by a 2½-yd Marion 480 electric shovel, which begins loading at the highwall and advances the full length of the pit. Approximately 30 ft of solid coal is left along the spoil bank to serve as a haulage road for the tractor-trailer haulage units. Leaving the strip for final loading serves the twofold purpose of providing a solid roadbed for the trucks and preventing contamination and breakage of the valuable clay under the coal. After the strip of coal along the highwall is removed, the shovel starts at the far end of the pit and loads the remaining coal in the roadbed. Thus haulage units always have a solid roadbed in the pit.

While the coal loading is progressing, the handloading contractor moves in and begins recovering the small quantities of coal remaining along the edges of the pit. One of the bulldozer units also begins to scrape the bottom of the pit to expose a clean surface of clay. The remaining fine impurities on top of the clay are removed with shovels by men.

Coal loading continues until noon



HOW COAL FLOWS through the flexible plant at Old Glory No. 33. Five-track tipples processes 1,800 tons per shift.

and the remainder of the shift is devoted to loading the 12 to 14 in of fireclay under the coal. Management supervises the clay loading very closely, inspecting the clay frequently to prevent higher-silica material from being loaded. Clay loading and hauling is handled by the same equipment as is used for recovering coal. Clay usually is hauled to a special hopper and delivered directly to railroad cars but it can be stockpiled in an area adjacent to the clay-loading area. A

2-yd Northwest diesel dragline is available for transferring the stockpiled clay to the clay hopper.

HAULAGE EFFICIENT

Haulage units consist of two Walters tractors and four Autocar tractors pulling two 25-ton and four 20-ton Austin-Western trailers. Four of the tractor-trailer units are regularly assigned to the hauling job, the remaining two serving as spares.

Haulage roads are built 40 to 45



RECOVERY OF CLAY and loose coal along edges of pit adds to income. Quality is checked closely.



CLAY LOADING FACILITIES are located adjacent to preparation plant. Dragline handles stockpiled material.

ft wide on a compacted spoil base topped with several inches of No. 2 crushed limestone. After this has been compacted, either No. 7 or No. 9 limestone is spread on the surface and compacted. After coal and clay loading has been completed the road is extended into the pit.

Pit drainage is handled by a group of 3- and 4-in centrifugal pumps that are readily moved from place to place as needed.

Power is delivered to the property at 33,000 v and is stepped down to 4,000 v for operation of the dragline and shovel. A skid-mounted transformer further reduces voltage to 440 for operation of the highwall drill and pumps.

PREPARING THE COAL

The preparation plant was designed and constructed by the company's engineering force. Dewey Brown, former general superintendent of preparation plants, was responsible for the original design, but Mr. Brown died shortly before the construction was begun and work continued under the direction of Ed Greenwood, his successor.

A 60-in apron feeder transfers coal from the 150-ton bin to a 60-in flight conveyor that delivers it either to a grizzly or to a 5x16-ft Allis-Chalmers Ripl-Flo vibrator. The grizzly separates the coal into plus 6-in lump and 6x0 fractions, the larger size flows to a McNally-Pittsburg 48-in double-roll crusher and is reduced to 6x0. Crushed coal joins the underproduct from the grizzly and the combined product is delivered to the 5x16-ft vibrator, which separates it into plus 1½, 1½x1 and 1x0 fractions.

The plus 1½ flows to a shaker sizing screen and is separated into plus 6 in,



SUPERVISORS at Old Glory No. 33 mine, Coal City, include Perry Haviland, superintendent; Denver Hadley, tippie foreman; Hershel Rea, clerk.

6x1½ or 6x4, and 4x1½. These sizes are handpicked on the loading booms before passing to railroad cars. Refuse passes by chute to a 24-in refuse conveyor and is delivered to a 6-ton refuse bin for removal by a Euclid dump truck. The 1½x1 may be sent either to the shaker screen or mixed with the 1x0 from the vibrator and delivered to a two-compartment 30-in flight conveyor feeding a 6x16-ft double-deck Ripl-Flo vibrator making 1½x½, ¾x¼ and ¼x0 sizes.

The ¼x0 is delivered to a 5x12-ft Ripl-Flo vibrator equipped with Allis-Chalmers heated screen cloth and is separated into ¼x½ and ¼x0 fractions.

The ¼x0 is discharged into a 24-in refuse conveyor and delivered to the refuse bin. The ¼x½ is delivered to the No. 5 carbon track.

Any of the handpicked sizes may be discharged from the ends of the loading booms to a two-compartment 36-in mixing conveyor and delivered to the crushing and rescreening section of the plant. There they are fed to an Allis-Chalmers double-roll crusher and reduced to 2x0. A 4x12 Productive Equipment Gyroset double-deck vibrator separates the crusher product into plus 2 in, 2x1 and 1x0 fractions.

The plus 2 in is recrushed in a second 24-in McNally-Pittsburg unit to any size from 2x0 down to ¾x0. The most common product is 1½x0 which is delivered to a second Gyroset unit and separated into 1½x1 and ½x0 fractions. These products join those from the first Gyroset and flow to railroad cars.

A Viking hot oil-treating system is installed on all loading tracks. On Tracks 1, 2 and 3 the coal is treated on the loading booms, and on Tracks 4 and 5 it is treated at the discharge ends of the loading chutes.

Regular samples are taken daily of all sizes and sent to the Commercial Testing Co. in Terre Haute for analysis.

Operations of the preparation plant and clay loading is handled by 13 men classified as follows: 4 slate pickers, 1 oil man, 1 screen and chute change man, 4 car droppers, 2 car cleaners and 1 tippie operator.

Officials at Old Glory No. 33 include: Perry Haviland, superintendent; Arthur Kelley, pit foreman; Denver Hadley, tippie foreman; and Hershel Rea, clerk.



KENNAMETAL* U-7's help pioneer continuous mining in Indiana

... give 40% lower bit cost at Enoco Collieries

Enoco Collieries No. 5 seam is known as a "toughie" in Indiana. Until recently this six-foot, boulder-ridden measure was considered economically impractical to mine with continuous machines due to high bit cost.

Before continuous mining was a success under these rugged conditions, many grades, types and brands of carbide tools were tested, together with modifications aimed at improving rates of penetration and bit life.

Their lowest bit cost per ton—40 percent lower than that of any other tooling used—was achieved using Kennametal U-7 Bits. These bits had a 20-degree rake angle recommended by Enoco's general superintendent, John Stachura. They increased penetration speeds in solid work up to 15 inches per minute, in recovery work up to 28 inches per minute ... *an average of better than three inches per minute over speeds achieved with other carbide tools tested.*

A recent operating report showed an average weekly production of 365 tons, or approximately 45 tons per man at the face.

This is not an isolated case. Kennametal is increasing productivity and lowering bit cost per ton wherever it is used. The next time you buy, be sure to specify Kennametal. *It will cost you less in the long run.* KENNAMETAL, INC., Bedford, Pa.



Proper application important

The two bits shown above were originally identical. They were used in the same machine for drilling the same material ... hard sandstone. Operating at low torque and high rpm, the bit on the right drilled four inches before it was removed. It was not reusable. Compare it with the bit on the left which drilled six feet in this material, but at high torque and low rpm. This bit is just now in need of reconditioning. The difference was in the application of the tools. Your Kennametal representative is a specialist in proper tool application. Let him help you achieve best performance.

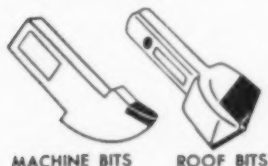


Reconditioning—when and how

Proper bit reconditioning and changing intervals are very important, if not essential, to lowest bit cost. As a guide to setting up procedures for grinding your own tools, or judging if commercial grinding is being done properly, Kennametal offers you a comprehensive, new booklet entitled, "The When and How of Reconditioning Kennametal Bits." Write for a copy.

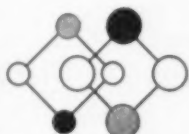
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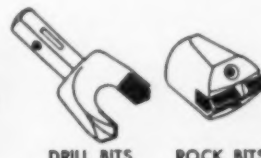


MACHINE BITS

ROOF BITS



INDUSTRY AND
KENNAMETAL
... *Partners in Progress*



DRILL BITS

ROCK BITS

FINANCIAL AID TO HIGHER EDUCATION

Business Aid for Our Colleges — Voluntary or Involuntary?

Previous editorials in this series have shown that:

- As a group the nation's independent, privately endowed colleges and universities are in grave financial trouble, and
- There are many different means by which business firms can extend a helping hand to these institutions.

This editorial, one of a series devoted to the financial problems of higher education, submits this proposition: **If business firms do not voluntarily go to the financial aid of higher education, there is every prospect that they will soon be providing more financial support for higher education involuntarily, through taxation.**

If this prospect materializes, one of the basic elements of a well-balanced system of higher education—a strong array of independent colleges and universities—may well be dangerously weakened if not destroyed. And in the process a potentially crucial bulwark for freedom of enterprise in the United States—that same strong array of independent colleges and universities—will be undermined.

Acceptance of these propositions implies absolutely no disparagement of tax-supported colleges and universities. These have an indispensable role in the total system of higher education in the United States. Leaders of these

institutions would be among the first to agree that their position is strengthened by a strong system of independent institutions, supported privately rather than by political agencies.

What is the evidence that in one way or another, voluntarily or involuntarily, business will be giving more financial support to higher education? One impressive part of this evidence is provided by the recent rapid increase in the proportion of college and university students attending tax-supported institutions.

Rapid Shift in Enrollment

In the fall of 1952 tax-supported colleges and universities enrolled about 7.5 per cent more students than the independent institutions. In 1953 this percentage was doubled. And in 1954 the tax-supported institutions enrolled 26 per cent more students.

In the case of students entering college for the first time the relative growth of the tax-supported institutions recently has been even more striking. In 1952, the number of beginning students in the tax-supported schools, as reported by the U. S. Office of Education, exceeded those in the independent colleges and universities by 35 per cent. In 1954, just two years later, this figure jumped to 49 per cent.

Why has the proportion of students attending tax-supported colleges and universities been in-

creasing so rapidly? There are many reasons. But a dominant reason is that, in order to keep going at all, the independent institutions have been forced to make large increases in the prices they charge for instruction. The purchasing power of their endowment funds has been cut in half by price inflation. The capacity of the wealthy to supplement their endowments by gifts, as they have done in the past, has been greatly reduced by high taxes. As a result these schools have been forced to rely increasingly on higher prices for instruction (tuition as it is called in academic circles) to make both ends meet.

Since 1940, the independent colleges and universities have raised their tuition fees by an average of about 60 per cent. This is considerably less than the increase of about 100 per cent in prices generally since 1940. And it is nowhere near enough to prevent the faculty members of the independent colleges from faring miserably in terms of salaries, a matter of major national importance to which we shall return in this series. But the increase in tuition fees of the independent colleges has been much greater than the increase in the fees charged by the tax-supported schools. And that price differential increasingly tends to shunt students into the schools which are supported chiefly by taxes. Independent colleges now charge, on the average, about \$580 per year for a full course of instruction while the tax-supported institutions charge, on the average, about \$240.

Bigger Tax Bill in Prospect

A large increase in the total enrollment in our colleges and universities during the next decade is in prospect, particularly when the great increase in births during World War II is reflected in the number of young men and women of college age. With a total of 2.5 million students at present enrolled in our institutions of higher learning, it is estimated that the total will be over 3 million by 1960.

If this trend continues most of the anticipated increase in college and university enrollment will be concentrated in tax-supported institutions. Indeed, if the shift toward tax-supported institutions that has occurred in the last three years were to continue over the next six years at the same rate, about two million of the three million students anticipated in 1960 would be in tax-supported colleges and universities and

one million in independent schools. In 1950 there was a 50-50 division in enrollment. This shift would mean, of course, a corresponding increase in the tax bill for tax-supported education. And of this bill, we can be sure that an ample share would be assessed against business firms.

No Easy Solution

The best way, of course, to put a brake on a soaring tax bill for higher education is to help the independent institutions get in shape financially to carry a larger share of the student load. For most companies the development of a mutually satisfactory program of financial aid for higher education is a complicated process. In fact, it is so complicated that some companies with an initial disposition to provide financial help are inclined to despair of working out a mutually constructive plan.

If, however, the leaders of business will contemplate seriously the only available alternative to their extending voluntary help to our independent colleges and universities, their determination to work out a plan will be strengthened. For that alternative involves a grave weakening of our system of higher education, together with an involuntary increase in the financial support of higher education by business. The increase would come through higher taxes. Contemplation of such an alternative should, if necessary, toughen the will of business firms generally to do everything possible to extend financial help to our independent colleges and universities.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

FOREMEN'S FORUM



Wide World Photos

The Seed of Greatness

*The lives of great men all remind us
We can make our lives sublime,
And, departing, leave behind us
Footprints on the sands of time.*

—Longfellow

IN THIS MONTH OF FEBRUARY we celebrate the birth anniversaries of two beloved and respected Americans, George Washington and Abraham Lincoln. Each in his own time contributed indispensable service to this nation, and both now reside in special niches in American history.

But in reflecting upon the careers of these two men, one is struck by the fact that both could achieve the highest office in the land even though their early lives were spent at opposite ends of the social scale. One was born of a wealthy family; the other was born into poverty.

Did Washington and Lincoln display any common characteristics which might explain how they could proceed from such opposite beginnings toward the same goal, the Presidency? Let us review their lives in search of such common traits.

WASHINGTON'S BACKGROUND

In 1732 Virginia was a thriving agricultural empire. Each plantation was a

community in itself, supplying the greater portion of the needs of those living in the community, which included the proprietor and his family, tradesmen and slaves. Frequent parties and balls were held in the happy mansions. Life was good in such surroundings, and Washington was the son of a plantation owner.

Very soon, young George was the owner in his own right. At the age of 20 he inherited the family holdings upon the death of an older brother, Lawrence, and within a few years he had added substantial acreage. At the age of 27 he married Martha Custis, a widow having a respectable fortune of her own. He was a rich man and a leader of Virginia society at an early age.

But he was a responsible citizen, and a serious-minded businessman in all matters pertaining to the affairs of the plantations. Had he been made of softer stuff, he might have taken this attitude: "Why should I exert myself? I can keep myself busy and comfortable in the management

of these holdings. Let others take the risks in these arguments with England."

But prospects of a life of ease could not undermine his character; he never rejected his country's demands upon his time and talent.

LINCOLN'S ROUGH ROAD

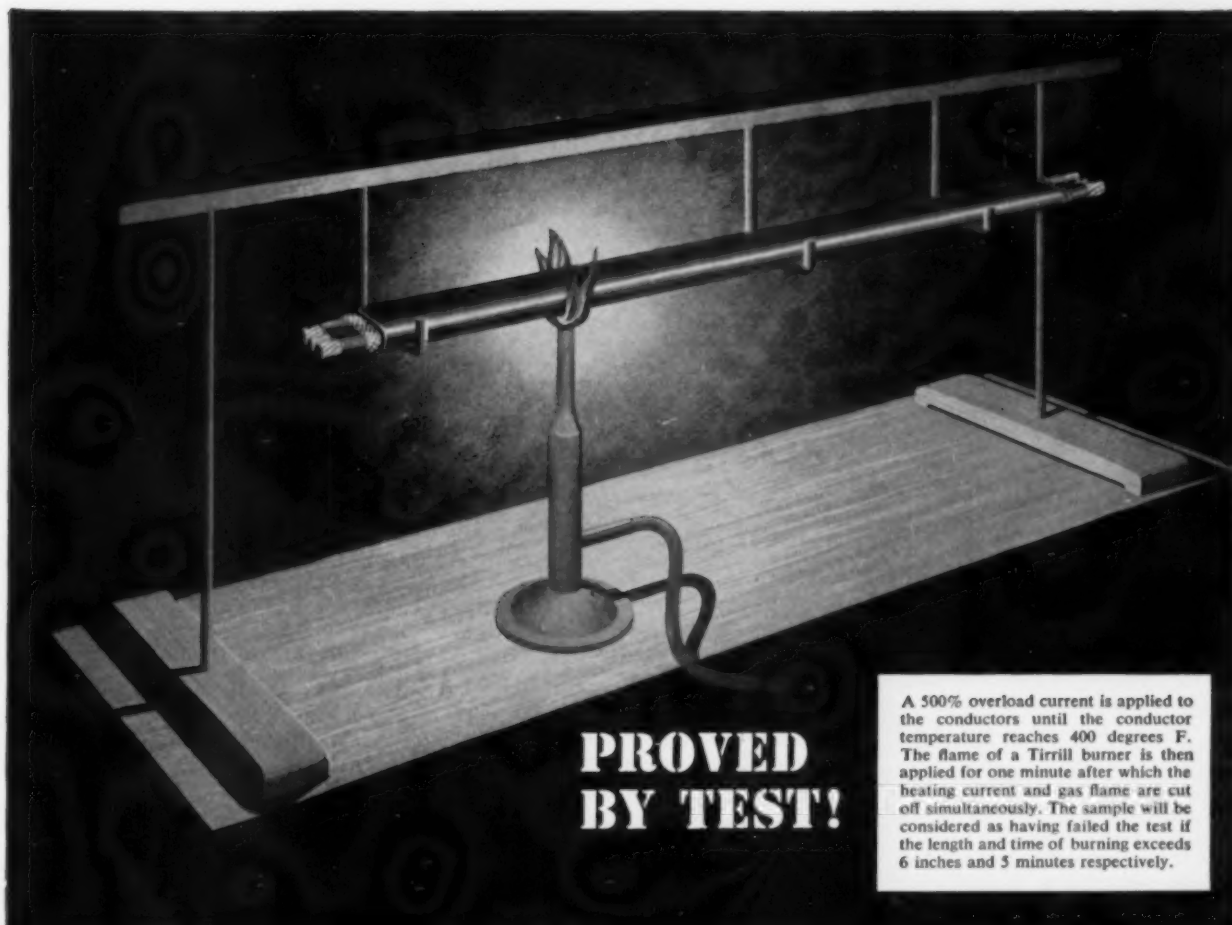
Lincoln, on the other hand, grew up in vastly different circumstances. He was born in a sod-caulked cabin in the backwoods, as the familiar account tells us. His father is described as a shiftless fellow who could not seem to satisfy himself for any length of time, in occupation or location. The Lincoln family was poor, even when judged by frontier standards.

Abe's mother, Nancy Hanks Lincoln, died when the boy was about 8 yr old. We can assume he was hungry at times and overworked at others. As a youngster he survived one winter in a strange new land in an unfinished cabin having one side open to the weather. Who could predict the exalted future awaiting this underprivileged boy?

He lived through other disappointments. His young sweetheart died. He worked long hours at hard jobs. He suffered political defeats. Had he been made of softer stuff, he might have taken this attitude: "Why should I exert myself? The fates are against me. I give up."

But Lincoln was made of sterner stock. We can be almost certain he spent very little time in such morbid moods.

(Continued on p 100)

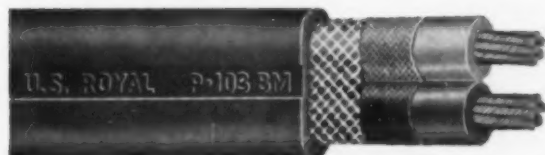


**PROVED
BY TEST!**

A 500% overload current is applied to the conductors until the conductor temperature reaches 400 degrees F. The flame of a Tirrill burner is then applied for one minute after which the heating current and gas flame are cut off simultaneously. The sample will be considered as having failed the test if the length and time of burning exceeds 6 inches and 5 minutes respectively.

Flame-Retardant

U. S. Royal Mine Trailing Cables



Write for free illustrated booklets, "U. S. Electrical Wires and Cables for the coal mining industry" and "U. S. Royal Gold Portable Cables for the mining industry."

Ordinary underground coal mine trailing cables—when ignited as a result of either mechanical injury or overload—will propagate flame and may carry the fire to other sections of the mine. *But not U. S. Royal Cables!* They are jacketed with a special flame-retardant 60% neoprene compound which also withstands cutting, chipping, abrasion, grease and oil.

U. S. Royal gives "Service beyond price and specification" because United States Rubber Company is the only electrical wire and cable manufacturer to grow its own natural rubber, make its own synthetic rubber and plastics. Such control of the manufacturing process results in a *quality* product. Available in black, or gold for better visibility.

UNITED STATES RUBBER COMPANY
ELECTRICAL WIRE AND CABLE DEPARTMENT, ROCKEFELLER CENTER, NEW YORK 20, N. Y.



THE COMMON TRAIT

There is a brief sketch of each of these men, and they are as different as night and day. But let us take one more look.

Neither Washington nor Lincoln had the advantages of extensive schooling. They could have had only a smattering of grammar-school experience at most. However, here is where their common trait begins to show. Both had a healthy thirst for knowledge, the seed of greatness, and both were apt learners. Authorities tell us that Washington, at the age of 14, was engaged in surveying and plotting property lines in the vicinity of his home. He quickly mastered the rudiments of scientific agriculture, and he was a respected military leader in his early twenties. He taught himself well in a wide field of interests.

Lincoln, too, was a seeker of knowledge. You no doubt have heard how he studied arithmetic at the fireside after working all day. He was an avid reader with a wide range of interests. Lincoln also took a turn at surveying, he worked as a clerk, and he elevated himself to the profession of law.

The similarity in the personalities of the two men can be further extended. Both men applied newly-gained knowledge as quickly as they could. As soon as Washington learned surveying, he surveyed; as soon as he mastered military science, he set forth on military missions; as he gained new knowledge of agriculture, he applied it on his lands. Lincoln applied his learning in the same way.

There was very little pressure on either of these young men to undertake this learning task. It might have been argued that Washington in his position would have little need of broad learning, and Lincoln in his circumstances might never find use for his learnings.

They continued to learn and apply, nevertheless, because not doing so would have been foreign to their nature. Then when informed leadership was needed, their friends and acquaintances knew where to look for it. Therefore, our conclusion is that among great men the common denominator is an insatiable desire for knowledge accompanied by the ambition to apply the knowledge.

OBJECT OF THE LESSON

Perhaps the greatest lesson we may take from the lives of Washington and Lincoln is that a man who possesses a sincere desire to learn is a worthy competitor. If you have this trait you are a comer. If you can acquire the learning habit there is much hope for your future.

Having arrived at this conclusion concerning Washington and Lincoln, can we support the thesis? Well, one example that springs to mind is that of Thomas A. Edison's experience. He was sent home from school as a youngster because, it was charged, he could not learn. Not long afterward, the entire world was feeling the impact of Edison's ability to learn and apply.

There is much to be said for the learning a man is able to acquire through his own efforts. Like good meat and potatoes, it stays with him.

Stress Shuttle-Car Safety . . . Today and Every Day

IF YOU SUPERVISE A UNIT employing shuttle cars for face transportation, you are urged to take all possible steps to insure the safety of the operators. A recent report of the Bureau of Mines notes that 36 shuttle-car operators lost their lives during a 2½-yr period. That is a terrible toll because the total number of men employed as shuttle-car operators is not proportionately great. Half the total number of deaths resulted from a single cause, that is, being crushed between the car and the rib or timber. These are facts presented at a recent meeting of the Wyoming Council, Holmes Safety Association, Mullens, W. Va., by W. R. Park, health and safety supervisor, USBM, Mt. Hope, W. Va.

Mr. Park continued with other startling facts. Of the 18 men killed in the manner previously described, only five were full-time operators. The others were men of limited experience or were unauthorized operators. Even some officials were among the victims.

It appears that strict discipline is called for. Don't permit operation by unauthor-

ized persons if you can prevent it, and don't take the wheel yourself. A shuttle car is not comparable in any way with an automobile or truck—the shuttle car is far more demanding. Give new and inexperienced operators as much time as you can afford to make certain they form proper habits at the outset. And check on the old timers—their minds may stray.

Twelve other operators, Mr. Park says, lost their lives when they struck their heads against overhanging obstructions. A clear right-of-way is essential, because an operator has a number of things to think about and may momentarily forget to duck under a hindrance. Most of the men killed in this manner were experienced operators. The inference is that where the trainee realizes the roof hazard but cannot control the machine, the experienced operator knows his equipment but forgets the roof.

The supervisor's responsibility for shuttle-car safety demands that he give it a large share of his attention and that he provide the best possible physical conditions along the right-of-way.

Why Hurry?

THE DECEMBER, 1954, ISSUE of *Electrical Mining*, published by Goodman Mfg. Co., carried a valuable message from the Illinois State Medical Society on the benefits of proper routines in daily activities. The article reads as follows:

The person who turns over for five more minutes' sleep, leaps out of bed, gulps a cup of coffee and dashes for transportation to work, starts—and usually finishes—the day in a tension that over the years will result in frayed nerves and irritability of disposition.

The word routine conveys the idea of steady patterns which, to some individuals, means monotony. That is unfortunate, because a sensible routine offers a rhythmic mode of living that obviates strain and tension.

Hurry produces excitement of the body that creates excitement of the mind. Frequently this attribute is called "pep," but erroneously so, because the latter quality stems from a healthy body and mind and a zest for living and accomplishment. On the other hand, the fatigue brought about by hurrying constantly encourages depressed and morbid thoughts.

The human body is a machine with a mechanical ratio of units of fuel to energy output. The more effort one puts out, the more fuel is burned up. The faster an engine is driven the greater the amount of gasoline consumed.

Frequently, speed is necessary, calling for a little extra effort to complete a project or meet some emergency. If body and mind are co-ordinating well, the strain will not be too noticeable. But the person

who day in and day out refuses to inject rhythm into his activities will show the strain.

Nervous tension can be avoided by learning to relax. Stabilizing the day's program will help reduce the need to hurry. Arising in the morning in sufficient time to dress and eat leisurely is the first step. Spacing and timing are important in setting up a working schedule. Hurry is not conducive to poise or to efficiency.

Stop crowding your activities. Too much of this while you are young will lessen your chances of growing old gracefully, not to mention the possibility of the many conditions that may result from tension, such as heart afflictions, high blood pressure, "nervous indigestion" and just plain bad disposition. Think it over and when you start to hurry—take it easy instead.

The new salesman was sent to call on a customer in the next town. When he arrived he was embarrassed to find he had misplaced the customer's name. He wired his company, "What is the name of our customer?"

Back came the reply, "Williams, Edgar B. Your name is Johnson, Elmer."

The art of conversation includes the habit of listening.

Character is a by-product of a life devoted to duty.

Truth is on the scaffold, when Wrong is on the throne.

—The Consol Dealer

JUST **TRY** TO LUG A D6 DOWN!



That's a big load of "dead" material on the blade! This Caterpillar D6 Tractor is 'dozing and cleaning up a slate dump at the Page Coal and Coke Co., Pageton, W. Va. One reason for this heaping, high-profit load is the rolling action imparted by the scientifically curved moldboard of the Cat® No. 6A Bulldozer. Another reason is the ability of the Caterpillar Diesel Engines to develop maximum "push" under load. Under all operating conditions, this Cat Diesel *will not foul*, thanks to exclusive engine and fuel injection design.

In addition to 'dozing and clean up, Page Coal uses its D6 for prospecting and facing up new mine openings, swamping out trails, and road building. "Our D6 does lots of heavy work and gives us very satisfactory service. And it's certainly economical," says Lloyd Oxley, foreman. Fuel consumption is a modest 2½ gallons of money-saving No. 2 furnace oil per hour.

Important in operating economy is the rugged construction of the D6 with matching bulldozer. Owners report many thousand hours of dependable work life

from these husky yellow machines. Now available with a new, oil-type flywheel clutch, the D6 can deliver even longer trouble-free operation on jobs that are particularly rough on clutches. Ask your Caterpillar Dealer for details.

See your nearby dealer for on-the-job *proof* that a Caterpillar "team" of tractor and bulldozer can do most work for *you* at lowest cost. And count on your Caterpillar Dealer whenever you need fast, skilled service and genuine factory parts.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

**NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE**

OPERATING IDEAS



AUGER SECTIONS being handled with the first type of hydraulic hoist developed (left), which proved a great time saver over the chain hoist originally used. Later design of hydraulic hoist (right) offers advantage of 30-ft cable travel.

Three Ideas Speed Augering Operations

AUGER-MINING EFFICIENCY at the Rich Creek mine of the Snap Creek Coal Co., Tomlinson, Logan County, W. Va., was considerably improved by designing and installing a hydraulic hoist to replace the chain hoist originally used to handle the auger sections; by the addition of a special conveyor extending under the auger; and by a rotating discharge chute.

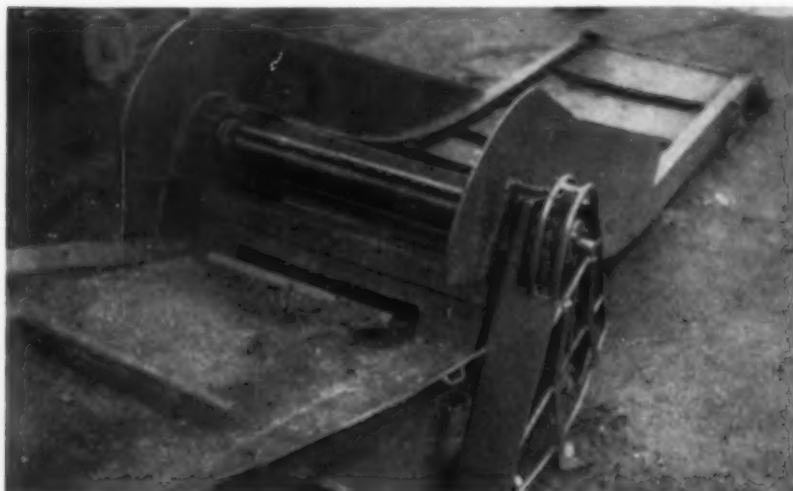
TWO TYPES OF HOISTS HANDLE AUGER SECTIONS

The first type of hydraulic hoist used

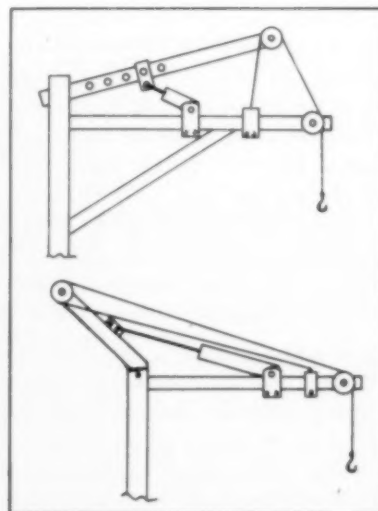
at the mine is shown in operation in the left photo above. The hoist was built in the mine shop and has served satisfactorily for a number of months. The jack proper is a double-acting unit from a bulldozer. Adjustment of lift and rope travel can be made by changing the position of the clamps holding the jack base to the lower boom and changing to different holes in the upper boom. The auger machine is a McCarthy unit with a 30-in auger in 6-ft sections.

A different type of hydraulic hoist on another McCarthy auger recently put into

use at the Rich Creek mine is shown in the right photo. This jack was designed and built by Albert C. Desrosiers of Desrosiers Brothers Coal Co., Logan, W. Va. The jack proper used on this type of hoist is a double-acting unit with a 4-in bore and 30-in stroke. An advantage of the latest-type hoist over the first design is greater rope travel. An auger section stored 30 ft from the ma-



"JIFFY" CONVEYOR—Folding extension for elevating conveyor is designed to fit back underneath the auger and clear the coal away from it.



THREADING of wire rope for first hydraulic hoist developed to handle auger sections (top) and for later-type unit (bottom).

Cities Service C-300 cuts make-up oil 600%!

Stone cold facts from the
Chenoa Stone Company, Chenoa, Illinois



Mountains of Work at Chenoa, Ill.

5 one-and-a-half yard shovels . . . 2 diesel-driven crushers . . . 2 Dumpsters . . . a limestone crushing mill. Part of the equipment constantly in use at Chenoa Stone Company . . . constantly powered and lubricated by Cities Service products.

Here's the story in the words of David D. Vickrey, Superintendent of Chenoa Stone Company:

"About two years ago, we switched from another nationally prominent brand oil to Cities Service C-300 Series Motor Oil. The results have been amazing.

"C-300's detergent action completely eliminated a bothersome sludge problem. On our first three oil changes with it, we removed 5 gallons of sludge from each of our 200 horsepower diesels. Since then, these diesels have remained clean, and today, when we open the crankcase, we can even see the paint.

"We also are using far less oil between changes. In fact Cities Service C-300 actually cut make-up oil from 5 to 6 gallons every 150 hours to less than

one gallon every 150 hours!

"In addition to C-300 oil, we use Cities Service Lubricants for every requirement . . . Diesel Fuel, Gasolenes, Trojan M Grease and hydraulic fluid. We have been completely satisfied with every product.

"Cities Service has given us top-notch service, the best we've ever had. We are better supplied than ever and have learned to rely on Cities Service dependability."

There is nothing Cities Service could possibly add to Mr. Vickrey's statement, except a reminder to contact your local Cities Service representative in order that you may enjoy similar results in *your* operation. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Auger Ideas . . . Cont'd

chine can be pulled from that position, hoisted and coupled at the borehole without changing the hitch. Details of the wire-rope threading on both types of hoists may be seen in the accompanying drawings.

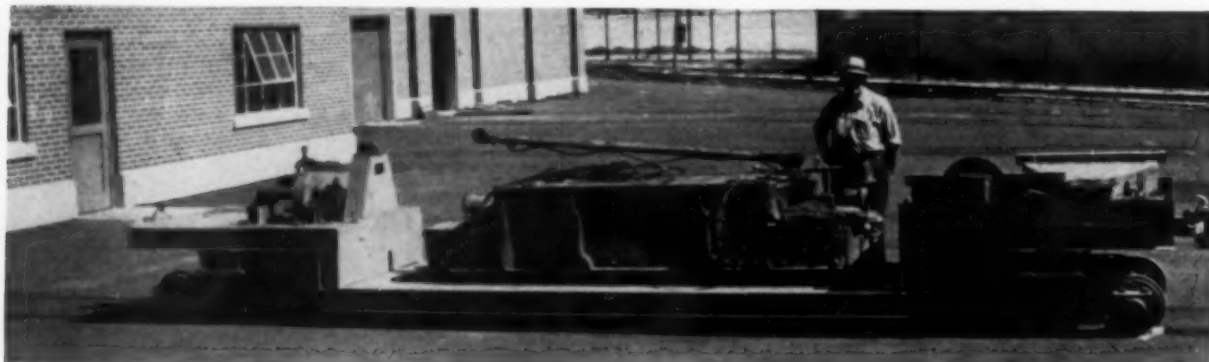
"JIFFY" CONVEYOR CLEARS COAL

Another improvement on the second

augering machine, also designed and built by Mr. Desrosiers, is what he calls the "Jiffy" conveyor, illustrated in the lower photo. It is attached to the bottom end of the elevating conveyor and extends back under the auger, thus clearing the coal away from the machine. It is driven from the bottom roller of the elevating conveyor. For long moves, its end can be lifted and folded back 180 deg over the elevating conveyor.

CHUTE SPEEDS LOADING

Still another Desrosiers improvement on this machine, but not illustrated, is a rotating discharge chute on the upper end of the elevating conveyor. By operating a crank conveniently located on the side of the conveyor, the chute can be rotated to any position for changing from one truck to another, trimming the load or temporarily dumping unmarketable material onto the ground.

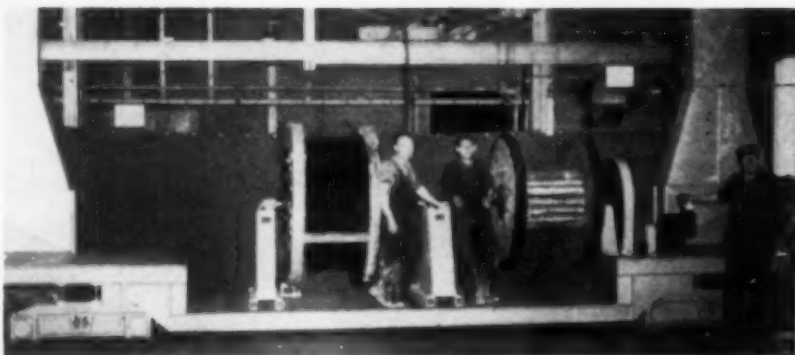


Versatile Mine Truck Saves Time and Effort

NECESSITY is the mother of invention. And that's the reason behind the building of this versatile mine low boy, designed by Roy Neally, master mechanic, U. S. Smelting, Refining & Mining Co., Salt Lake City, Utah. Changing cables on the main hoist in the mine always was a difficult and time-consuming job until the new truck was developed.

In addition to handling hoist cables, the unit may be used effectively to transport spools of conveyor belt, mining equipment and large, heavy parts.

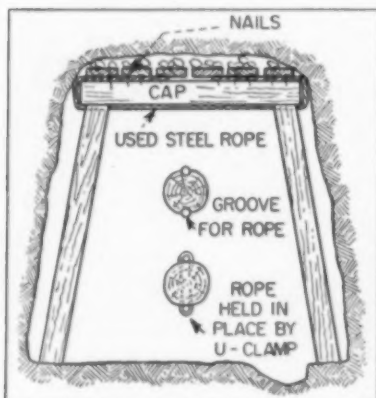
The low boy is designed to handle two 6-ft-diameter reels, each 4½ ft wide. Holes drilled in the deck of the unit permit almost any desired spacing of the support pedestals so that positions of the reels can be shifted as needed. The supports also can be arranged to handle reels of various sizes. The "wind-on" reel is equipped with an air-motor-driven mechanism and the "wind-off" reel has a brake to apply tension to the cable as it is wound onto the drum hoist. An electric



motor can be installed in place of the air unit where compressed air is not available. The brake is a 4-in metal band which encircles the edge of the reel and may be adjusted for various sized reels.

Over-all length of the 5-ft-wide truck is 24 ft, with a 20-ft wheel base. The underslung section of the deck is 13 ft

long and is 12 in above the rail. Designed to carry a maximum load of 20 tons, the deck is supported by four extra-heavy 6-in I-beams that extend through the platforms over the wheels. Heavy gussets tie in the deck frame and the platforms over the wheels and thus make the unit rigid.



How to Reinforce Crossbars With Wire Rope

IN ADVANCING THROUGH HEAVY GROUND it may be advantageous to strengthen crossbars as shown in the accompanying sketch. A length of used steel rope is wrapped tightly around the length of the crossbar, and the overlapping ends of the rope are nailed down. If the crossbar is a round timber, a

groove may be provided to hold the rope in place or staples or U-clamps may be employed.

The reinforced crossbar is installed in the normal manner. Pressure at the center of the bar will be taken up in the steel rope, thereby preventing excessive bending of the crossbar.

YOUR IDEAS WANTED . . . *Coal Age* has a standing offer of \$10 or more for each "Operating Idea" acceptable for publication. Why not tell us about yours? Just describe it in your own words, send a sketch if needed and a photo if you have one available. Write: The Editor, *Coal Age*, 330 W. 42nd St., New York 36, N. Y.

J. Robert Bazley, Inc., Contractor, Gets Controlled Breakage with AMERICAN EXPLOSIVES

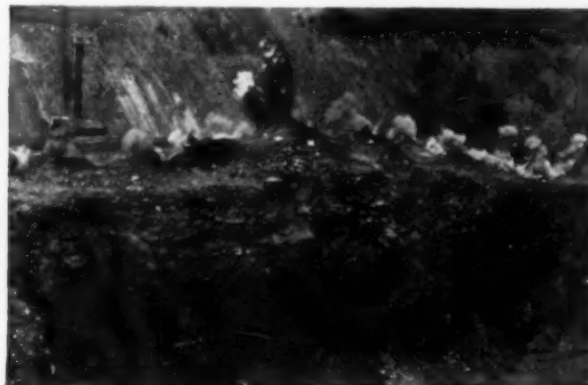
The right American explosives, properly placed and detonated, give contractors and mine and quarry operators the kind of controlled, clean breakage that assures efficient and profitable operations.

American Explosives, blasting caps and

accessories are available in a wide range of densities, velocities and strengths to meet every blasting requirement. Plants and magazines in key locations throughout the country can fill your needs, and capable field engineers are available at your call. Make your next order American.



Contractor — J. Robert Bazley, Inc., Pottsville, Pa.: shaley formation mixed with seams of medium limestone. Fourteen blast holes averaging 71 feet deep drilled in a line 30 feet apart and 30 feet back from open face.



There she goes! Holes were loaded with American Container-Cartridges containing low speed, low sensitivity dynamite, detonated with Plastic Primacord* in each hole and hooked to a trunk line of Plain Primacord.



Notice the heaving, churning motion with which the rock flowed out. Flying rock is notably absent.



This clean, even breakage means easy shoveling and loading — another good shot with American Explosives.

THE AMERICAN LINE:

HIGH EXPLOSIVES
PERMISSIBLES

BLASTING POWDER

BLASTING CAPS

ELECTRIC BLASTING CAPS —

(INSTANTANEOUS,

REGULAR DELAY,

SPLIT-SECOND DELAY)

BLASTING ACCESSORIES



AMERICAN Cyanamid COMPANY

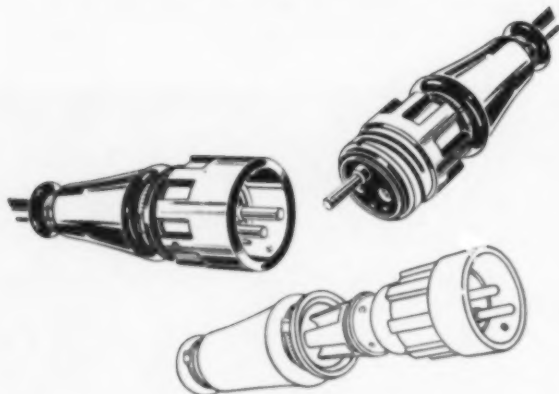
EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.

Sales Offices: Latrobe, Pa., Pittsburgh, Pa., Pottsville, Pa.,
Scranton, Pa., Maynard, Mass., St. Louis, Mo., Bluefield, W. Va.

*Registered trade-mark of
Ensign-Bickford Co.

EQUIPMENT NEWS

New Attachable Connectors Speed Cable Sectionalizing



New Joy line of attachable electrical plugs and receptacles for mining requirements are called the "Quick-Loc" series because a three-quarter turn couples or uncouples them. Easily attached to cable, the new connectors are available for AC or DC applications from 35- to 450-amp ratings (No. 8 through 750 MCM, AWG). Factory molded of flame-resistant neoprene compound and equipped with corrosion-proof couplings or mounting shells, they are watertight, distortion-resistant and shatterproof, the maker reports. Plugs consist of two parts: the connector head containing contacts and wiring terminals, and a protective neoprene sleeve that fits over the cable-connector juncture. Assemblies are snugly held together by three gear-driven ring bands, as illustrated. New Bulletin B57 with full details offered by Joy Mfg. Co., Dept. J-1, Oliver Bldg., Pittsburgh 22, Pa.

Truck-Mounted Drill Cuts Drilling Costs

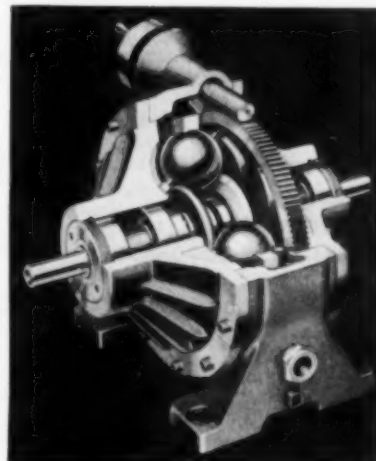


A new and improved model of its M-8A heavy-duty rotary drill, announced by Davey Compressor Co., Kent, Ohio, is designed for mounting on any standard truck and utilizes both compressed air and high-pressure water for drilling. It has a rated capacity of 6 3/4-in holes up to 300 ft with air and 1,000 ft with mud, and is said by the maker to permit substantial reductions in drilling costs. The Davey 500-cfm compressor and pump are driven by a GMC-471 engine mounted on the truck bed and employing a five-speed transmission for different drilling rates. The new Model M-8A is recommended by the maker for water-well drilling, core drilling, structure testing and shot- and blastholes. Its 30-ft mast has a fabricated steel crown block assembly with two 20-in-diameter roller-bearing sheaves, and the unit is designed for pulling 15-ft drill-section stems.

New Variable Speed Drive Dependable and Economical

The newly announced Cleveland "Speed Variator" is a simple compact drive that provides variable output speed over a 9:1 range from a constant-speed power source with exceptional economy of space and dependability of performance, according to the maker. Based on a Swiss invention proved in service in various countries abroad, the unit has been designed to meet American operating conditions, and following several years of development and testing now is available in sizes from 1/2 to 10 hp. Employing the rolling action of a series of balls, the device is said to permit

smooth adjustment of output speed from 1/4 to 3 times the input speed while operating under load, with speed regulated by a simple indicating manual adjustment or by manual- or power-operated remote controls. Since the power-transmitting capacity of the unit depends on its size and the input speed selected, the drive chosen will handle its full power rating over the entire range of output speeds, the company points out. Bulletin K-100 with full details offered by the Cleveland Worm & Gear Co., 3269 E. 80th St., Cleveland 4, Ohio.



$$1 - 1 = 0$$

$$20 - 1 = 19$$

it's simple arithmetic

Figure it out for yourself! ONE BIG haulage system completely shutdown by one small repair job equals zero production capacity. TWENTY Q C F *Constant Haulage* Mine Cars affected by one small repair job still leaves you 95% capacity. The damaged car is simply switched to a siding and the rest of the load moves on!

Why not call in your nearby Q C F Representative and get all the facts about the shutdown-proof, nonstop-unloading Q C F *Constant Haulage* mine car system? Q C F Industries, Incorporated, New York • Chicago • St. Louis • Cleveland • Washington • Philadelphia San Francisco • Huntington, W. Va. • Berwick, Pa.



More Wheel Milage!

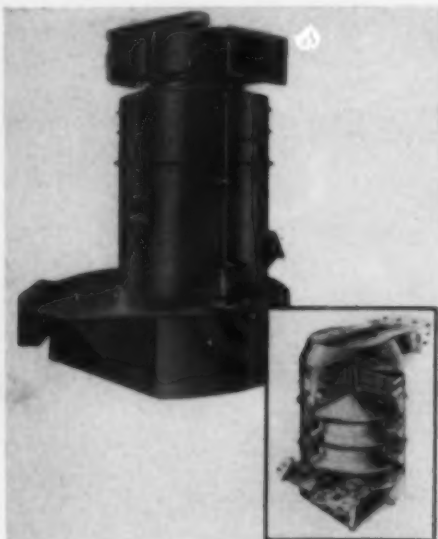
Ask for the facts about our NEW "LOAD SUPPORT" MINE CAR WHEELS that stop tread splitting "break-offs," "flats" and "load-lifting" ...deliver more milage.



ac f

MINE CARS

for Constant Haulage



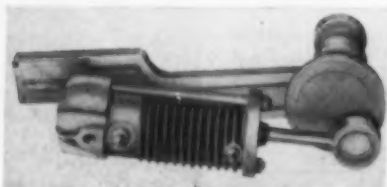
New Wet-Type Dust Collector

Its new wet-type dust and fume collector, consisting of a cylindrical drum with a series of cones and baffles, is based on a new operating principle and is available in a selection of models for a variety of industry-wide applications, according to the Van-Truer Co., Inc., 12600 Beech Rd., Detroit 23, Mich. Water, supplied by a direct-driven pump, cascades downward within the collector, producing a series of closely related water curtains through which the dust-laden air is filtered in its upward travel. A double row of moisture eliminators, fabricated in convenient handling size, are mounted above the washing chamber. In operation, the dust- and fume-laden air is in continuous fluid contact during the upward flow, with the baffle design setting up a cyclonic washing action and turbulence, separating the wet dust and carrying it to the sludge tank below, the maker reports. Saturated air continues up through a two-stage moisture eliminator and emerges completely dry. The unit has a flat bottom which serves as a settling tank from which the water is recirculated, and is equipped with a chute for easy hand clean-out or with a flight conveyor for ejecting sludge into a container. Bulletin with details from company.



FASTER TRACTOR-SHOVEL

Increased engine power of 100 hp at the flywheel and faster speeds are among the several improvements in the Traxcavator No. 6 shovel, offering greater production on the job, according to the Caterpillar Tractor Co., Peoria, Ill. In addition to increase from 2 to 2 3/4 cu yd in bucket capacity, No. 6 shovels now have a two-position feature that permits maximum use of bucket capacity under normal conditions, and the obtaining of maximum scouring and dumping action when handling sticky, hard-to-dump materials, it is said. The Traxcavator No. 6 shovel travels at almost 30% higher speeds, with increases from 1.4 to 1.9 mph in first gear, from 5.8 to 7.4 mph in fifth gear. A new hydraulic pump increases the pressure in the hydraulic system to 1,450 psi, which provides greater lifting power for faster bucket action.



TRACTOR-MOUNTED COMPRESSOR FITS ALL MAKES

New Worthington-Mobilco portable air compressor can be attached to the rear power take-off of all makes of tractors quickly and easily to provide a low-cost compressed-air supply for such operations

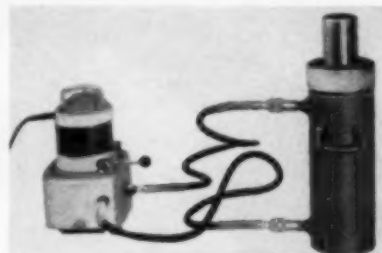
as power-greasing tractors and other equipment in the field, pumping gasoline, spraying paint and maintaining correct tire pressure, the maker says. The unit can be attached to a tractor power take-off in a matter of minutes and has a capacity of 2 cfm at 400 rpm, with pressures up to 120 psi. With changeover piston and cylinder kit, the compressor can be converted quickly into a pump that can be used for washing down equipment, pumping drinking water, etc. Full information from Worthington Mower Co., Stroudsburg, Pa.



SCREEN SEPARATOR NOW MORE EFFICIENT

New tangential discharge spouts have replaced rectangular-shape spouts on Sweco vibrating screen separators 48 and 18 in diameter, thus permitting greater efficiency and speed to develop in material as it spirals out on the screen and through the discharge at the frame wall. Sweco separators utilize a unique gyratory motion imparted by a vertically mounted motor, with material fed to the screen surface separated in a vertical flow pattern. Weights attached to the motor shaft above and below the motor impart a vibratory motion to the entire screen frame assembly sitting on springs. The adjustment of these weights (in eccentric opposition) permits processors to quicken or retard the travel speed of material on the screens—thus increasing or decreasing the screening rate according to the material being classified or separated.

More information in Data File 107-312 from Southwestern Engineering Co., 4800 Santa Fe Ave., Los Angeles 58, Calif.



NEW 60-TON JACK-PULLER

A new 60-ton hydraulic jack and puller with a separate motor-powered pumping unit has been announced by Templeton, Kenly & Co., Broadview, Ill. Designed for heavy-duty jobs, the jack's hydraulic ram can be both raised and lowered by power, which permits faster retraction so that the ram may be positioned more quickly, the maker points out. Called the Model RP798C0-6010 Re-Mo-Trol, the jack has a 10-in travel. Connected to the pumping unit by flexible hydraulic hose, the ram can be remotely located for greater operator safety and easier use in cramped quarters. The 60-ton ram also is available with a remote hydraulic hand pump, the Model RP7-6101, which features automatic two-speed changeover on the pump. It raises the ram at high speed when positioning and automatically shifts to low speed when full power is needed. Both models are described in Form R-6010 from Templeton, Kenly.

MORE POWER AND FUEL ECONOMY FOR NEW TRUCK ENGINE

The new 140-hp International Black Diamond 264, a high-torque, valve-in-head gasoline engine said by the maker to provide exceptional power output and fuel economy, has been introduced as optional equipment for the five International R-160 series truck models, according to the Motor Truck Div., International Harvester Co., 180 N. Michigan



Power at your Fingertips!

NEW O-B RAIL CLAMP HAS BUILT-IN HANDLE,
CARRIES 400 AMPS WITHOUT OVERHEATING

For use on any size rail
up to 100 lbs. Takes No.
14 to 2/0 cable. High
strength handle is built-
in. Weighs only 18½ oz.

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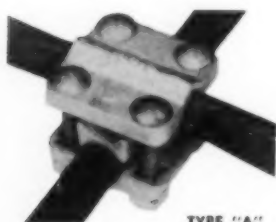
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O-B Branch Connectors - - **Safe, Neat, Fast!**



TYPE "A"



TYPE "B"

For any combination of copper and aluminum cables, running parallel or at right angles, in sizes ranging from 4/0 to 1,600,000 cm. See your April, 1954, **Haulage Ways** or write direct to Ohio Brass Company for ordering information.

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Ave., Chicago 1. Designed to power trucks in the 14,000- to 17,000-lb GVW range, and highway tractors rated at 29,000-lb GCW, the 6-cylinder BD-264 incorporates major advancements in engine design that offer such benefits as economy, greater performance and longer life, in addition to the significant power advantage, it is said. Important factors in achieving fuel savings in Harvester's newest engine are a newly-designed dual-barrel downdraft carburetor and latest-type manifolding, and the engine's sustained power exerts definite lessening influence upon such normal operational conditions as downshifting, lugging, and fuel-consuming variance in engine speed and driving effort, the company points out. Also contributing to the many performance characteristics of the BD-264 is a solenoid-operated overrunning-clutch-type positive engagement starter to facilitate starting in extremely cold weather. A new 11-in clutch provides more than 14% increase in facing area and incorporates such improvements as a fully-ventilated cover and roller-mounted fingers that minimize friction and reduce pedal pressure by 25%. Full details from company.



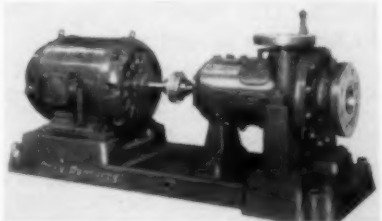
ARC WELDER COMBINES AC-DC

The Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio, has introduced a new universal combination arc welder which provides a choice of either AC or DC welding current. The new machine, called the "Idealarc," is said by the maker to provide an ideal type of welding arc for every type of manual welding application, permitting selection of either AC or DC and either a soft or forceful arc for maximum efficiency and performance. Available in several combinations, the machine can be obtained as an AC welder without the DC current, to which a DC package can be easily attached in about 1 hr whenever desired. It is also available as a combination AC-DC machine with selection of either current made through a simple twist of a switch handle, and different output capacities of DC and AC can be combined to fit the machine to the job requirements. Current models available are 300-, 400- and 500-amp AC combined with DC capacities of 200, 300, 375 and 450 amp. Full data from Lincoln Electric.



MORE HEAD PROTECTION WITH NEW-TYPE HARD HAT

An entirely new approach to the science of head protection has been announced by Willson Products, Inc., Reading, Pa., with its new "Super-Tough" safety hats and caps featuring the "Geodetic" suspension and pneumatic headband cushion developed by the Cornell Aeronautical Laboratory, Inc. The "Geodetic" or "great circle" crown suspension, available only in the new Willson line, distributes the force of a blow evenly over a large area of the head, it is said, thus minimizing the effects of the blow and the transmittal of any shock from the shell of the hat to the brain. The pneumatic headband cushion, consisting of a series of 12 vinyl-plastic air cells located between the sweat band and the shell of the hat, functions to resist and distribute the impact of lateral blows on the perimeter of the head. The pneumatic feature also provides a completely comfortable cushion-fit on the head, with size adjustment accomplished by simply regulating the air. The shell of the Willson Super-Tough hat is molded of Fiberglass-reinforced resins, and both hats and caps are available in five colors: yellow, red, green, gray and white. Bulletin offered by the company.



PUMP PARTS INTERCHANGEABLE

Interchangeability of parts is one of the outstanding features of a newly re-engineered and completely integrated line of single-stage end-suction centrifugal process pumps announced by Dean Brothers Pumps, Inc., 323 W. 10th St., Indianapolis 7, Ind. Stressing simplification of design and construction, and standardization of so-called special features, the line offers a wide range of units for varying services with capacities from 3 to 7,000 gpm. Size and capacity of each pump in a series is determined solely by variations in the size of only three parts, the casing, impeller and suction nozzle, the maker reports. For example, while in the R-10 series there are 11 pumps rang-

ing in size from 1x2 to 4x6 in, one standard cradle assembly serves for all 11 pumps. Various construction features are standard throughout the line and every pump is available in any of five standard material classification. In addition to reducing replacement parts stocks, uniformity and simplicity of design throughout the line afford a saving in maintenance man-hours since there are no special adjustments and no special tools or fittings are needed. Five new bulletins, one for each series, are offered by Dean Bros.



RUBBER-TIRED TOWING TRACTOR HAS 4-WHEEL DRIVE

New Model TU-80 4-wheel-drive towing tractor added to the Hough "Payload" line is a low compact unit powered by either gasoline or diesel engine with a drawbar pull of 8,000 lb. Capable of handling the largest commercial aircraft, the unit is a powerful, versatile and maneuverable tractor for many applications in industrial plants. Use of 4-wheel-drive on large pneumatic tires makes it efficient for both indoor and outdoor work, the maker says. The combination of torque-converter-drive and 4-speed full-reversing transmission is said to supply the fullest range of speed selection and control for pulling or pushing from either end. Top speed forward is 22 mph and reverse speeds range from 9 to 33 mph. Full information from the Frank G. Hough Co., 735 Seventh St., Libertyville, Ill.

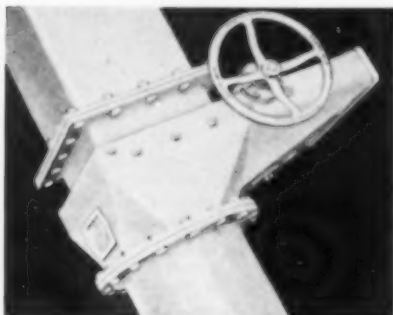
FLEXIBLE CONTROL CABLE

New flexible control cables with from 5 to 24 conductors in sizes 18 through 10 AWG now are available from the Western Insulated Wire Co., 2425 E. 30th St., Los Angeles 58, Calif. Conductors in the new Bronco 60 Certified control cable are made of pure annealed electrolytic copper for maximum flexibility and flex-life, and the outer protecting jacket is certified to contain not less than 60% new neoprene by weight, the maker reports. To facilitate identification, the name, type, size, number of conductors, rated voltage and flame-proof approval number of the U. S. and Pennsylvania mine bureaus (on Sizes 14 and larger) are vulcanized into the protecting sheath at 2-ft intervals. The cable is recommended by the maker for all types of control, recording, metering and signal circuits.

NEW TORQUE-CONVERTOR LINE HAS WIDE RANGE

A complete line of "Torcon" torque converters for application in heavy-duty,

off-the-road vehicles, as well as for stationary power plants, is now being produced by the Automotive Div., Clark Equipment Co., Falahee Rd., Jackson, Mich. Said by the maker to be the broadest line of torque converters available from any single source, Torcon units are available in wheels of 11, 12, 13, 14, 15, 16, 17, 18, 19 and 26 in. Of the single-stage type, the Torcon line includes rated capacities from 30 to 600 hp. The basic package consists of a standard mass-produced heavy-duty torque converter that is available "off the shelf" to engine and original equipment manufacturers, as well as to operators who want to up-date equipment. An important optional feature offered on the Torcon converter is a "free-wheel" mounting for the stator or reaction member, according to the manufacturer, an arrangement that is said to give the unit the combined advantages of the torque converter and fluid coupling, and permit taking advantage of 90% of an engine's speed-horsepower range. Full details from company.



COAL VALVE EASILY CONTROLLED

Newly re-designed S-E-Co. coal valve has been engineered to specifically overcome what have long been considered unavoidable coal valve operational difficulties, the maker reports. Its self-cleaning ladder racks and self-cleaning multiple-faced pinions alone practically guarantee its being possible to operate the valve quickly and reliably even after long periods of inactivity and where coal is unusually fine and moist or dusty, it is said. The new design includes a liberal use of stainless steel to combat corrosion and other features cited by the maker include dust-tight construction, strong steel gate and large ball-bearing-equipped gate-supporting rollers and relief chamber to facilitate closing of valve gate through standing coal column. Bulletin 97 offering data on various models with hand wheels or remote chain controls is available from Stock Equipment Co., Hanna Bldg., Cleveland 15, Ohio.

NEW-TYPE ALLOY STEEL FOR IMPACT AND ABRASION

A new type of alloy steel known as "Wearpact," featuring unusually high resistance to impact and abrasion, has been announced by American Steel Foundries, E. Chicago, Ind., following extensive field testing at metal-mining operations. This new alloy steel is unique in the sense that high initial hardness (470-520 Brinell) as shipped is combined with high resistance

to impact and it thus has the ability to withstand abrasion and impact immediately upon being placed in service, the maker points out. Wearpact can be welded by conventional arc-welding methods, with its hardness affected only in immediate area of the weld. It is machinable, using heavy-duty equipment, or it can be finished by grinding, and no difficulties have been encountered in casting it, the company reports. Wearpact has marked up unusual service records where it replaced other alloy steels in chutes, crushers and dipper teeth, among others, it is said.

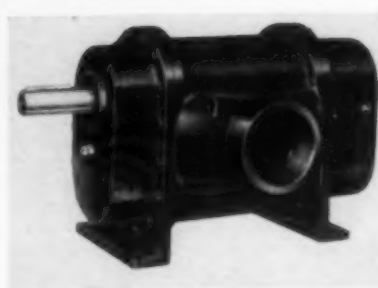


NEW ROTARY COMPRESSOR

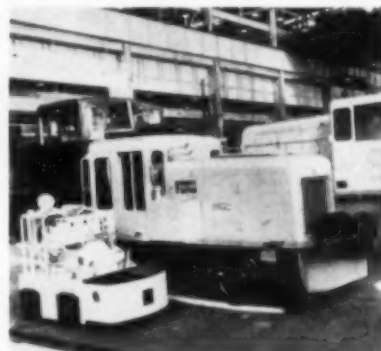
A new "Blue Brute" rotary compressor said to employ several new and exclusive design principles and features heretofore unavailable in rotary compressors has been announced by the Worthington Corp., Harrison, N. J. Among features cited by the maker are a hydraulically operated clutch that lets the engine warm up before the compressor is cut in, permitting easier cold-weather starting; a cylinder arrangement with full-gravity draining of oil during shut-down to prevent oil accumulation from damaging blades on cold starts; easy accessibility for inspection and maintenance without dismantling the entire compressor; and light weight and compactness for economical transportation and easier handling on the job. The new unit is available in 315-cu ft capacity, with additional sizes to follow.

LOWER-COST PUMPING OF WATER AND SEWER-SOLIDS

The new Lindquist positive displacement rotary pump incorporates a radical new design that makes for greater efficiency and economy at approximately half the cost of comparable pumps, according to the Lindquist Pump Corp., 10001 W. Jefferson Blvd., Culver City 12, Calif. Made in a range of sizes to handle all types of liquid solutions with capacities up to 2,200 gpm and pressures up to 1,000 psi, the units will pump water to



high-viscosity fluids and solids up to 78% and pump action will not break up semi-solids or aerate liquids, it is said. Design features cited by the maker include a quiet and compact unit combined with the means of handling a wider range of viscosities at standard motor speeds, minimum maintenance; elimination of valves to stick or pistons to gum up; installation above the level of the liquid to be pumped or at a considerable distance from the liquid source; and self-priming operation without cavitation or vapor locking.



DIESEL LOCOMOTIVES

Two small locomotives are now in production at the General Electric Co.'s Locomotive & Car Equipment Dept., Erie, Pa., the 1½-ton trammer (left) and the 10-ton diesel (right) which now are the company's smallest locomotives. Designed for both surface and underground hauling, the 1½-ton diesel trammer runs on either 18- or 24-in gage track and its normal 6-ft length can be shortened to 4 ft for lowering on mining-hoist cages. The 10-tonner is produced for industrial-plant switching and other surface uses, such as in quarries, open-pit mines and similar applications. With the addition of these products, General Electric now offers diesel and diesel-electric locomotives ranging in size from 1½ to 250 tons.

Equipment Shorts You'll Want to Check

HIGHER LIFTING LIMITS on mobile cranes are permitted by the unusually short length featured on the new Upson-Walton "Max-Lift" crane-hook block, it is reported. Other engineering features assure economical operation, long life and maximum safety. Specification booklet offered by Upson-Walton Co., 12500 Elmwood Ave., Cleveland 11, Ohio.

ELECTROMAGNETIC FLOW METER, introduced by the Foxboro Co., Foxboro, Mass., is designed for 2- to 8-in lines and will measure the volume flow rate of any liquid of sufficient conductance and velocity. Permitting various measurement applications impossible with ordinary metering equipment, the unit is unaffected by the pressure, viscosity, density or changes in the



CAT* power makes it **BOSS OF THE PIT**

A husky 500-HP Caterpillar D397 Diesel handles the 4 1/2-yd. bucket of this Lima shovel through a 60-ft. boom and 45-ft. stick. This shovel, working with a D397-powered Lima 6 1/2-yd. dragline, strips overburden from United States Coal Co.'s seam of No. 8 Pittsburgh coal. The seam, near Flushing, Ohio, is roughly 42 inches in thickness and two miles square. Normal coal production is approximately 300,000 tons per year.

The Caterpillar D397, in this Lima, is a "youngster" of approximately 500 hours. Its owners have every reason to expect the same long work life and low down time that their other Cat Diesels have given them. "Very satisfactory" is the verdict of A. H. Whitaker, manager of United States Coal Co., on Caterpillar performance.

For a tough job like this, where rock must be drilled and shot, and there's a lot of dust and grit in the air, it's significant that this veteran coal operator chooses to use Caterpillar power. Really *effective* filters and seals protect the precision of every Caterpillar Diesel. Long and economical work life is built into every engine with its famed Caterpillar ruggedness of construction, and such features as wear-resisting aluminum-alloy bearings and pistons and special "Hi-Electro" hardened crankshaft journals. For

low fuel cost and reduced maintenance, all Caterpillar Diesels are built to deliver full and foul-free power on low-cost No. 2 furnace oil.

Your Caterpillar Dealer—who offers fast service and dependable factory parts—will help you select the right engine or electric set for *your* job. There are 12 honestly rated sizes, up to 500 HP and 315 KW. Leading manufacturers can supply Caterpillar power in their shovels, draglines, compressors and other machinery. Be sure to specify Cat power when you order new equipment, or repower.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

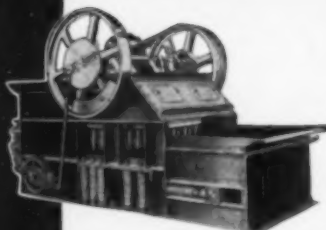
CATERPILLAR*

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**NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE**

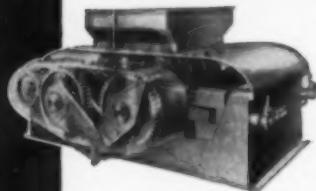
America's most complete line of CRUSHING EQUIPMENT

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McNelly Norton Vertical Pick Breaker

50% less fines when reducing lump to egg and stove sizes.



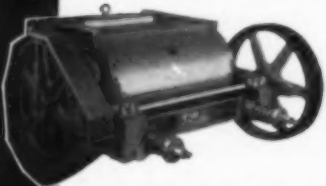
McNelly Double Roll Geomatic R. O. M. Breaker

Built in tonnage ranges from 750 tph to 1400 tph. Full floating Geomatic drive.



McNelly Geomatic Stoker Coal Crusher

This unit offers three prime advantages:
High volume production, plus accurate sizing, plus low percentage of fines.



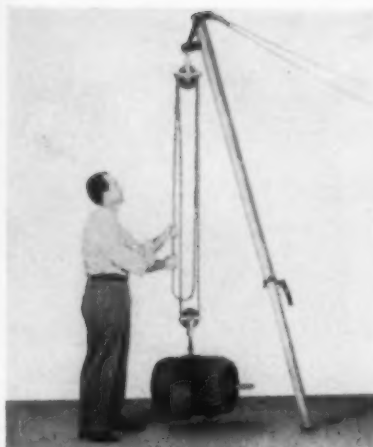
McNelly Single Roll Crusher

Universal application. 20", 24" and 36" dia. rolls.

For immediate action on complete information write, wire or call . . .

M^c

★ Pittsburg, Kansas ★
★ Wellston, Ohio ★



"PORTABLE SKYHOOK" provides a sturdy support for hoists while lifting or moving equipment at almost any location, according to the maker, B E. Wallace Products Co., Exton 10, Pa. The standard-model "Magic-Pole Unipod" shown weighs only 22 lb but can easily support 2,000 lb, it is said. Closed, it is 6 ft 4½ in long, extending by 6-in steps to 10 ft 2 in. Since load on the two high-strength 20-ft guy wires usually doesn't exceed 250 lb, they can be easily secured to posts or nearby machinery or to stakes outdoors. Complete unit sells for \$31.90.

conductivity of the liquid, the company says. It is connected to an electronic recorder to produce a chart record and is recommended by the maker for aqueous solutions, slurries, acids and other corrosives. Technical Report T1 27-A-71a gives details.

HEAVY DUTY BIN-LEVEL CONTROL, the S-A "Tellevel," has been improved by a redesign of the switch housing and deflector mechanism to further reduce the possibility of sticky material building up on the unit. Standard-duty and explosionproof Tellevels are available for lighter service with small lump, granular and powdered materials. Bulletin 11-0 with details from Stephens-Adamson Mfg., Co., Aurora, Ill.

NEW BUCKET DESIGN for use with its HD-5-G crawler tractor has increased rated capacity from 1 to 1¼ cu yd, reports the Tractor Div., Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. Other new design features cited provide reduced spillage, longer bucket life and easier loading.

HYDRAULIC POWER-STEERING BOOSTER designed for mobile machinery, such as, trucks and materials-handling, construction and mining machinery, achieves unusual compactness as a result of a new servo control valve design and relocated hydraulic connections. Called the Vickers Series S23, the booster is available either with or without a relief valve and can be factory-installed or mounted on vehicles in service. While having a longer stroke, the S23 can be interchanged with the

Series S6-270 units. The booster offers an important safety advantage by transmitting all road shock to the chassis and preventing the steering wheel from being jerked out of the driver's control when ruts or obstructions are hit, the company points out. Details from Vickers, Inc., 1400 Oakman Blvd., Detroit 32, Mich.

NEW WATTHOUR METER, featuring a capacity of 100 amp and an extended-range design capable of handling loads up to 667% of nameplate rating, has been introduced by the General Electric Co., Meter Dept., Schenectady 5, N.Y. Called the I-55, the single-phase meter is the latest member of the G-E I-50 line and offers such features as a magnetically suspended rotor, unit construction, co-ordinated insulation, corrosion-resistant materials and a unique retarding system, the company says.

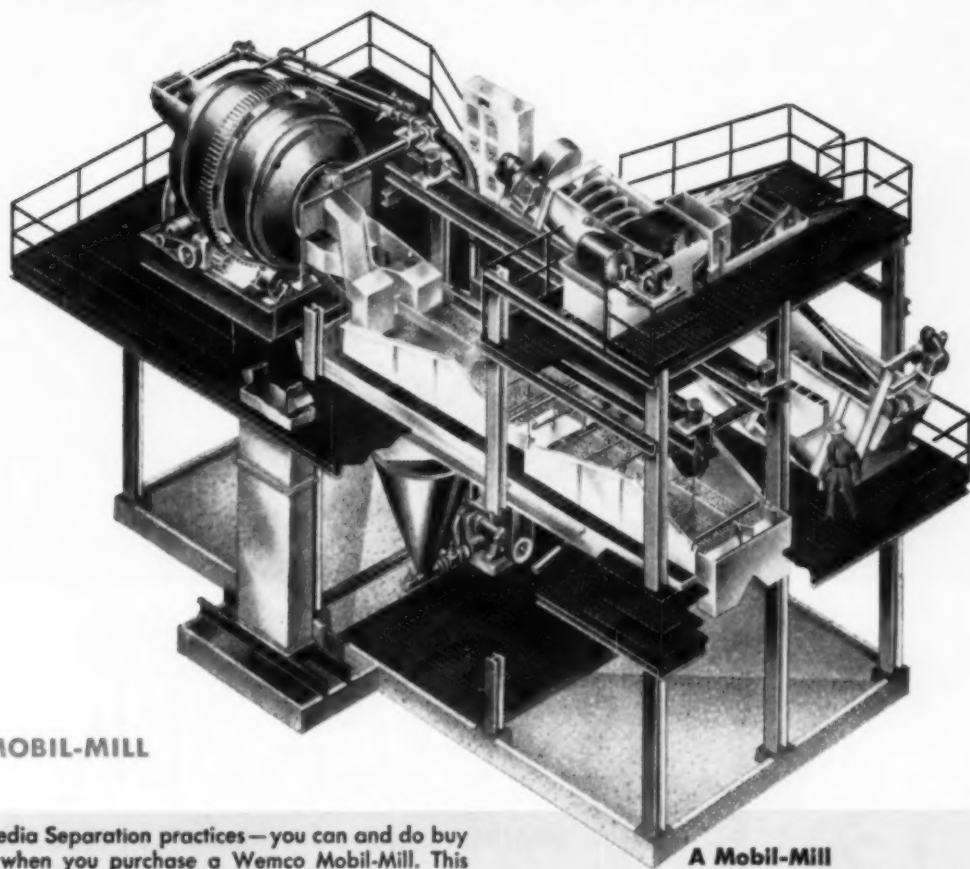
TWO-WAY RADIO SYSTEM, designed by Motorola for use in repair trucks and other vehicles, is a low-cost "packaged" system that offers operating flexibility and extra power to overcome audible noise levels, and is especially recommended by the maker for industrial areas made noisy by machinery, trucks, etc. The system takes up a minimum of space, is easily installed, operates interchangeably on 6- or 12-volt batteries and the basic radio can be readily modified to provide a custom installation at low cost, it is said. Full details from Motorola Communications & Electronics, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill.

POWER TOOL developed to meet the nut-running requirements of modern high-compression high-torque automotive engines is said by the maker to provide 25% more power and handle all



NEW-TYPE EXTREME-PRESSURE LUBRICANT, called "Spray-Lube," comes in an unbreakable aerosol dispenser and permits spraying open gears, chains, valve stems, etc., without preheating or use of brush and paddle. Spray-Lube can be used for temperatures too high for ordinary grease or oil, will not drip or throw off running gears and has excellent adherence that makes it a good rust preventative the company says. Selling for \$1.25 a can Spray-Lube also reduces waste, eliminates mess and lubricates otherwise hard-to-get-at places, it is said.

have you ever wanted to buy "experience"?



WEMCO MOBIL-MILL

In Heavy-Media Separation practices—you can and do buy experience when you purchase a Wemco Mobil-Mill. This prefabricated, built-to-order HMS plant offers a modern, highly economical method for precision coal cleaning. Behind every Mobil-Mill unit lies Wemco's extensive experience and leadership in HMS equipment manufacture. Attesting to this leadership is the fact that of all HMS plants in the world today, more than 50% are Wemco Mobil Mills.

WEMCO EXPERIENCE RESULTS IN THESE MOBIL-MILL ADVANTAGES
EFFICIENT CLEANING—accurate, consistent separations with high yield over a wide range of sizes and grades.

PREFABRICATED—for quick, low-cost field assembly in minimum time by Wemco or your own crews; easily dismantled and relocated.

FLEXIBLE DESIGN—engineered with a choice of components in combinations to suit individual coal washing characteristics.

MINIMUM FIRST COST—comparatively small capital investment per ton of washed coal.

LOW OPERATING COSTS—total costs average as low as 8c to 12c per ton of washer feed.

A Mobil-Mill Size and Model for Every Need

- Plants designed to handle any tonnage.
- Built to order for your job.
- Choice of 3 types of separators:

SINGLE DRUM—for accurately controlled washing of a full range of sizes from 8" to 1/4".

TWO-COMPARTMENT DRUM—for efficient cleaning of coal with middling content requiring two-gravity, three-product separation.

CONE—for economical production of coal up to 4" in size.

Write for Bulletin M-3-M-4 containing further information on Mobil-Mill applications to coal cleaning problems.

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The **FIRST**
loader designed specifically for Piggyback* Mining

The **LONG** MODEL 88 **PIGLOADER**

- A low-height, heavy-duty, SINGLE-MOTOR machine capable of continuous, high capacity operation!
- Long wheel base with wide tracks gives unprecedented stability and positive operation even in soft bottom!

PIGLOADER SPECIFICATIONS . . .

Rated Capacity: Average—3 Tons Per Minute, Maximum—5 Tons Per Minute; **Tramming Speed:** 120 Feet Per Minute; **Weight:** 14,000 Lbs.; **Electrical Enclosures:** U.S.B.M. Permissible Type; **Motor Horsepower:** A single 35 HP electric motor drives all machine operations; **Machine Controls:** All functions are controlled hydraulically; **Electrical Controls:** Non-reversing magnetic with start-stop pushbutton; **Conveyor Chains:** Heavy duty single strand design.

Another exclusive development by the originators of the Piggyback system of conveyor mining!

It's a proven fact that, for uninterrupted haulage from the working face, nothing even approaches the efficiency, operating economy and low capital investment of Piggyback Mining. Now—with the introduction of the Model 88 Pigloader—this unique system can be expected to offer even greater advantages.

A caterpillar-mounted machine, the Model 88 is very heavily built to withstand the hard usage of high-tonnage Piggyback mining. At the same time it is readily maneuverable and simple to operate. All functions, including raising and lowering the head and tail, are controlled hydraulically from a single bank of fingertip control valves. Further, the short length (16'), low overall height (26") and narrow width (5'8") of the Pigloader permits easier operation in close quarters and low coal.

If you're looking for more tons per man, higher total tonnages and lower operating costs, it will pay you to switch to low-investment, low-maintenance Piggyback Mining.

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FLEXIBLE PIPE AND CABLE can be laid underground without laborious hand digging or expensive machine trenching by use of a new pipe and cable layer that can be attached to a Ferguson tractor in a few minutes, according to the Ferguson Div., Massey-Harris-Ferguson, Inc., 1721 Packard Ave., Racine, Wis. Costing well under \$100, the tool will put flexible piping up to 1½ in in diameter into the ground up to 18 in deep at speeds up to 300 fpm. After an exploratory cut to check obstructions on the route, the piping or cable is laid out alongside the cut and threaded through the tool. As the tractor moves forward the subsoller tool cuts deep into the ground and lays the piping at the bottom of the cut. Driving the tractor rear wheel over the route levels the slight ridge left in the ground.

but the largest nuts and bolts on cars and trucks. Called the Size 5U "Impact-tool," the rotary electric tool has a ½-in drive, weighs only 6¼ lb and is said to have more power than any other ½-in electric impact tool in its size and weight class. Bulletin with details from Ingersoll-Rand Co., 11 Broadway, New York 4.

ARMORED CABLE with a polyvinyl-chloride covering over the armor for use in installations where corrosive conditions are a problem has been announced by the Construction Materials Dept., General Electric Co., Bridgeport 2, Conn. The new plastic over-all jacket is highly resistant to acids, alkalis, grease, oil and moisture; will not support combustion, and will not oxidize or deteriorate when exposed to sunlight and weather.

NEW INDICATING MILLIVOLT-METER announced by the Bristol Co.,

Waterbury 20, Conn., features short response time and high accuracy and can be used as a pyrometer, tachometer, pH indicator or for power-consumption measurements. Known as Model 580, it can be used with any primary sensing device capable of supplying a millivolt signal to the indicator. Bulletin P1244 gives details.

STEEL CONVEYOR PULLEYS in the American Pulley "HD" (heavy-duty) line now are available in either crown or straight face from 6 through 60 in diameter, 12- through 63-in face, for shaft sizes through 10-in diameter. Featured is the new interchangeable WT ("Wedg-Tite") split tapered hub, said by the maker to squeeze the shaft with a bulldog grip and eliminate "walking" of pulleys on the shaft, thus assuring longer life, less maintenance and speedier assembly. More data from the American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29.

CONCRETE AND MASONRY DRILLING of holes up to 3 in in diameter now is possible with its Model 27-RO electromagnetic hammer drill, according to the Syntron Co., Homer City, Pa. A construction change greatly increasing the power, together with use of a core drill, permits increasing hole diameter from the former maximum of 2 in to 3 in, it is said. Catalog 5410 gives details on Model 27-RO and other Syntron power tools.

NEW TYPE OF SAFETY SHOE designed for miners, plant workers, yard gangs, field crews and others whose feet are exposed to extremes of heat or cold is padded on the entire upper with a thin layer of foamed vinyl that contains millions of tiny "sealed-air" cells. The vinyl padding is superior to other insulating materials because it does not absorb moisture, perspiration, oil or odors, the maker says. It is available in an 8-in-high field boot and 12-in rubber winter-pac. All styles have steel-toe protection. Details from the Lehigh Safety Shoe Co., Emmaus, Pa.

LOW-SPEED TACHOMETER added to the Vibra-Tak line of low-cost pocket-size tachometers and vibration indicators has a range of 200 to 2,000 cycles per min. It may be used for finding the speed of oscillation on vibrating screens, conveyors, crushers, large engines, etc., and supplements the high-speed model designed for speeds from 2,000 to 15,000 cycles, the maker says. Details from Martin Engineering Co., Neponset, Ill.

FREE BULLETINS AVAILABLE

DETAILED INSTRUCTIONS FOR SPLICING and terminating its rubber-jacketed high-voltage cable (2,001 to 17,000 v, phase to phase) are offered in a folder printed on special long-lasting paper by the Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass. The booklet provides complete step-by-step instructions, with cable cross-sections printed in colors to illustrate the direc-

tions. As a new service to customers, Simplex will attach the instructions in an asphalt-impregnated envelope to all reels of cable being shipped, and will send the folder to others requesting Form 990.

ROTARY BLASTHOLE DRILL—16-p Bulletin 50-R-Z offers a complete description of the features and general specifications of the Bucyrus-Erie 50-R blast-

Super Scale for Conveyors

Builders Conveyoflo is unsurpassed for dependable, accurate weight-metering of belt conveyor flows. Pneumatic weight sensing system gives full-range metering with minimum vertical belt deflexion. Compact — no overhead framework or complicated lever arms. Adaptable to level or inclined installations.

Bulletin 550-H4A shows full accuracy statement and detailed engineering information. Write Builders-Providence, Inc., 395 Harris Avenue, Providence 1, Rhode Island.

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You will want complete data and the case experience of satisfied operators. Send for Bulletin 119.



CONCENCO FEED DISTRIBUTOR

The CONCENCO Revolving Feed Distributor is a heavily fabricated all steel machine with motor drive requiring 1 H.P. or less in operation. It effectively provides a splitting of feed into any desired number of equal portions, to accurately feed circuits or machines in battery for greater overall efficiency. Unexcelled for feeding coal washing tables.

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hole drill, a large-hole rotary drill designed to put down 9½- to 12¼-inch diameter holes. Rotary-drive machinery is powered by an electric motor and Ward Leonard controlled, a first for rotary blasthole drills, the anaker says. The 50-R features a heavy-duty crawler mounting, all-steel trussed frame and quick-leveling hydraulic jacks. Bucyrus-Erie Co., S. Milwaukee, Wis.

LOCKER ROOM DESIGN—A 40-p study covering the design of changerooms with overhead lockerbaskets has been published by the Moore Co., 1036 Quarrier St., Charleston, W. Va. The design file outlines standards to be maintained in the toilet, shower and locker rooms for maximum sanitation, efficiency and economy, and furnishes complete details and sections for laying out locker rooms with lockerbaskets.

RUST-PREVENTIVE PAINTS—Rust-Oleum Corp., 2799 Oakton St., Evanston, Ill., offers its new 24-p 1955 General Catalog 254 as a treatise on rust prevention. The enlarged catalog features 98 color chips of Rust-Oleum products and includes complete instructions for surface preparation and application of Rust-Oleum primers, short oil type, long oil type, machinery and implement finishes, chemical and heat resistant types, sealers, oil field finishes, thinning oils, and floor and masonry coatings. Among the new products described are the "Restful Color Group" of finishes developed to provide new color harmonies for plant interiors and machinery surfaces.

SCRAPER HOISTS—A full line of air and electric hoists for handling bulk materials of all types is described in a 44-p Catalog 5300-A offered by Ingersoll-Rand Co., New York 4. Outstanding features of each type and size are carefully outlined, along with specifications, capacities, sizes, symbols and accessories.

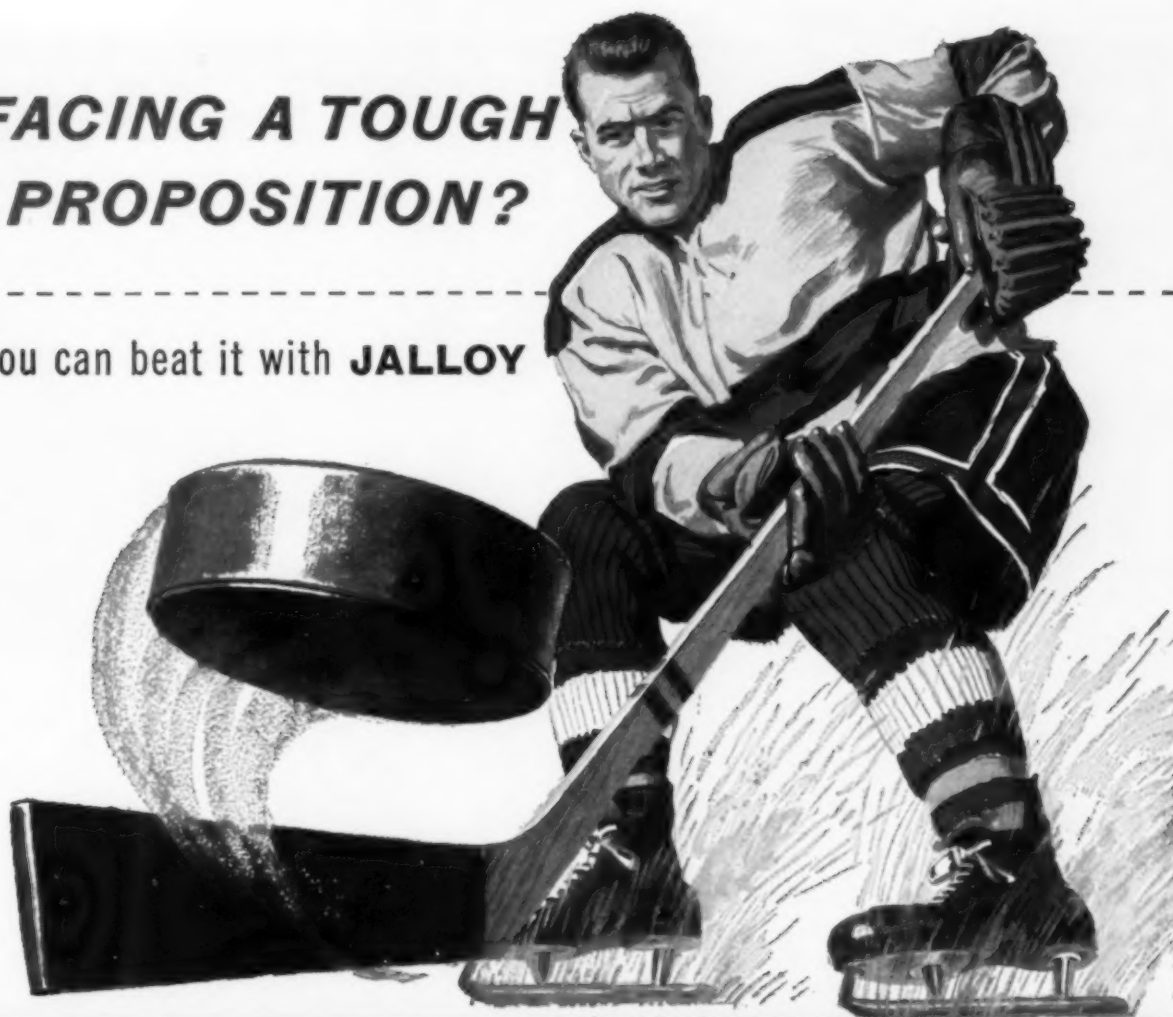
SAFETY EQUIPMENT—New 20-p Catalog 55 is designed to give complete information on all Bullard safety products quickly and easily. Covered are such products as hard hats, first-aid kits, packs and supplies, respiratory equipment, hoods, belts, etc. From the E. D. Bullard Co., 275 Eighth St., Dept. 531, San Francisco 3, Calif.

CONSTRUCTION PRODUCTS—Bulletin P.O. 8954, "Armco Construction Products and Services," briefly covers uses, description and advantages of various Armco products, such as, corrugated metal structures, liner plates, Multi-Plate structures, perforated pipe, welded steel pipe, steel sheeting, bin-type retaining walls, bridge plank, Flex-Beam guard-rail and Steelex buildings. From Product Information Service, Armco Drainage & Metal Products, Inc., Middletown, Ohio.

BELTING, RUBBER PRODUCTS—New 58-p general catalog on industrial rubber products is offered by Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Tacony & Comly Sts., Philadelphia 24, Pa. Sections on belting, hose, packing and molded rubber products include performance data, specifications, sizes and other necessary technical information.

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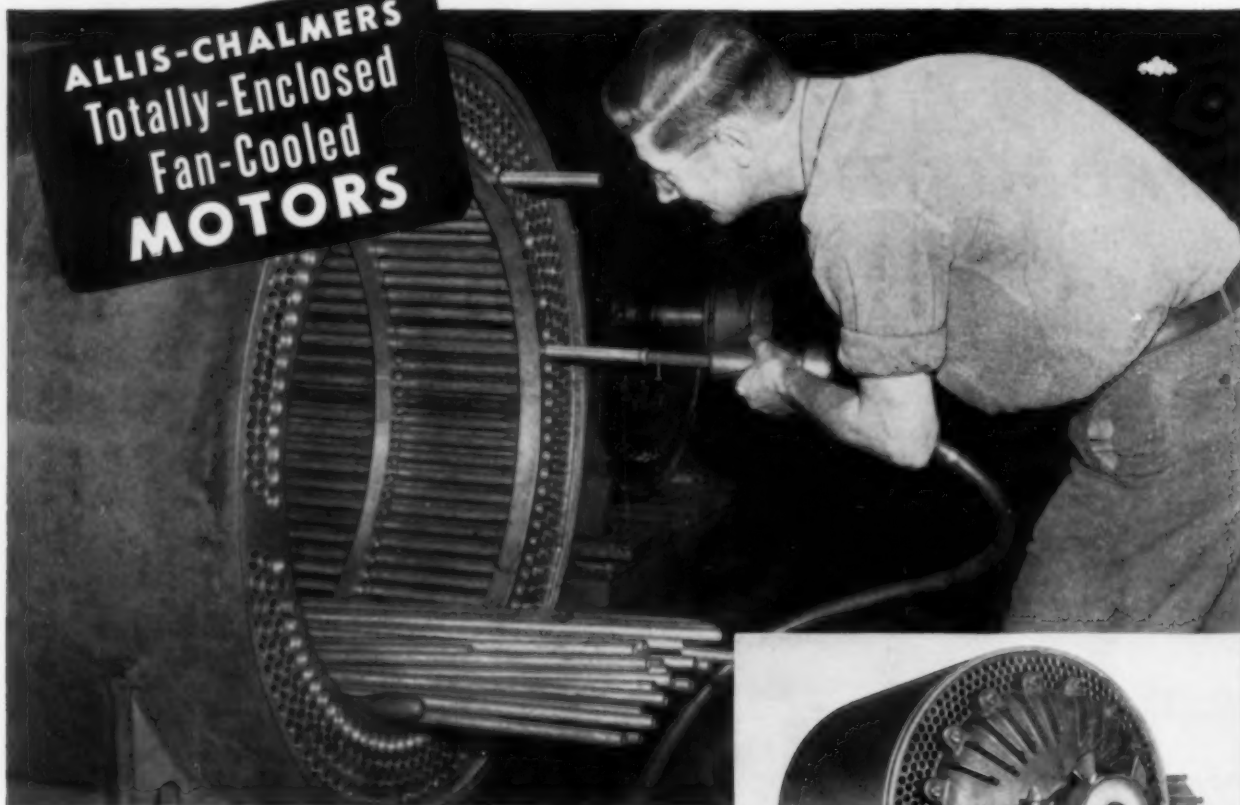
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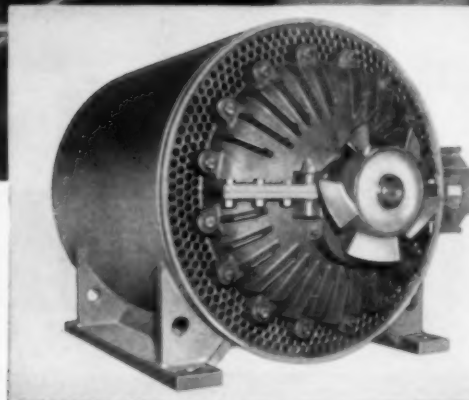
You can lick corrosion with this motor, too. Tubes are available in a variety of materials to meet practically any corrosive atmospheric condition. Allis-Chalmers tube-type motors have long and successful experience in such difficult

applications as caustic plants, refineries and petrochemical plants, power plants with fly ash problems and many others.

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Next time you need a motor for a dirty or corrosive location or for outdoor operation in all kinds of weather, call your Allis-Chalmers District Office. Get complete information on Allis-Chalmers tube-type totally-enclosed, fan-cooled and explosion-proof motors. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7149. Available in ratings on frames larger than NEMA 505 up to 3000 hp.

A-4559



3600-rpm explosion-proof motor with fan housing removed to show unidirectional fan.

ALLIS-CHALMERS



Other sections discuss belting and hose construction and selection.

ENGINE COUPLINGS—Fuller Mfg. Co., Kalamazoo, Mich., offers a bulletin on three new models of torque-converter couplings available for application to engine-driven industrial and materials-handling equipment and designed for use with engines developing 180 to 225 lb-ft of torque governed at 2,000 to 2,200 rpm or higher, and delivering up to 2.1:1 torque multiplication with automatic adjustment to 1:1 coupling operation as torque demand drops. Three new models are shown: Model 12-T with SAE No. 3 housing for use with automotive clutch and mechanical transmission; Model 12-U with 1½-in 10-spline shaft for straight-line drives with a universal joint; and Model 12-H with flanged output shaft for attachment of industrial-type couplings.

SHOVEL-CRANE—Koehring Co., Milwaukee 16, Wis., offers catalog describing the construction features, work capacity and wide application of its newly announced heavy-duty Model 405 excavator. The crawler-mounted 405 can be equipped with a full complement of attachments, including a 1-cu yd shovel and hoe dipper, 20-ton-capacity lift-crane boom, clamshell and dragline buckets.

SOUND FILMS—36-p Catalog B-6505 listing Westinghouse 16-mm sound motion pictures and slide films is available from the Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa. The guide covers a variety of subjects, and provides complete information for ordering the varied films loaned to all organized groups without charge.

SPUR-GEAR HOISTS—Bulletin YC-YCT from the Coffing Hoist Co., Danville, Ill., offers descriptions and specifications of the entire YC and YCT lines of spur-gear hoists, providing a total of 62 different sizes and models with capacities from ¼ to 25 tons. In addition to standard single- and multiple-chain units, models for specialized applications are shown, together with the various types of trolleys, both plain and geared.

WATER TREATMENT—Hardinge Co., Inc., 240 Arch St., York, Pa., offers a new 20-p Bulletin 35-D describing its line of equipment for water, sewage and industrial-waste treatment, including coal-washery wastes. The catalog shows details of construction and specifications for Hardinge circular clarifiers up to 200 ft in diameter, Hardinge rectangular clarifiers with crane-type scraping mechanism, and other units.

AUTOMATIC SAMPLING, its recognized savings and application to many different problems are discussed in a new Bulletin S1-B4 published by Denver Equipment Co., P. O. Box 5268, Denver 17, Colo. Specifications, detailed data and charts describe various wet and dry Denver samplers designed for applications where dust is a problem, headroom is limited, mixing of sample is required between sample cuts, etc.

MAGNETIC PULLEYS—Applications and features of Homer Hercules perma-

holds up the roof ...

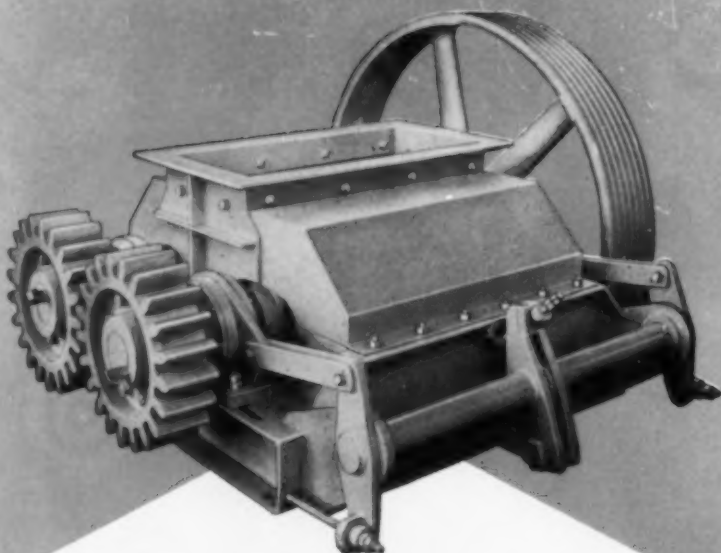


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Designed as a relatively inexpensive yet sturdy crusher for accurate sizing of the crushed product, the McLanahan Black Diamond Double Roll Crusher is available in 18", 24", 30" and 36" diameter rolls with roll widths from 18" to 60" for handling various feed sizes and capacities. Cast steel or semi-steel gears with extra long teeth provide adjustments in crusher opening. Anti-friction bearings.

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250 Wall Street, Hollidaysburg, Pennsylvania

nent magnetic pulleys are fully described in Bulletin PY-260, which includes diagrams, performance data, specifications and a guide for selecting proper size. Homer Mfg. Co., Inc., Dept 59, Lima, Ohio.

AIR COMPRESSOR—New bulletin describes various exclusive Le Roi features of the 85-cfm Airmaster, a heavy-duty unit designed for smaller jobs and utilizing a single cooling system, one lubrication system, and one crankcase and crankshaft to simplify maintenance. Specifications, tool capacities, and weights and dimensions for skid- and wheel-mounted units are given. Le Roi Div., Westinghouse Air Brake Co., 1706 S. 68 St., Milwaukee 14, Wis.

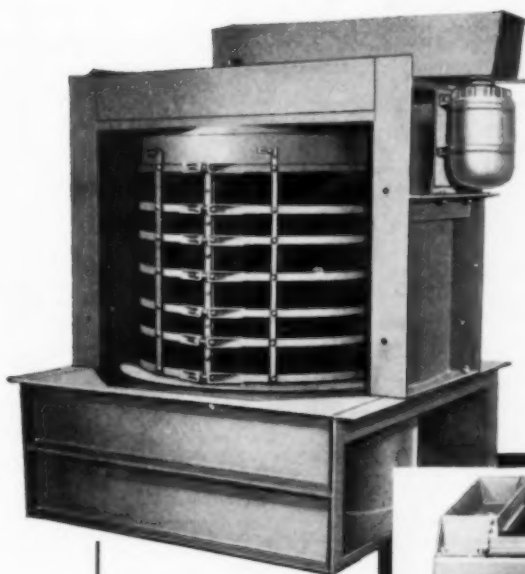
HIGH-STRENGTH STRUCTURAL STEEL BOLTS, replacing rivets for structural building, are covered in Booklet Adv. 648 from Republic Steel Corp., 3100 E. 45 St., Cleveland 27, Ohio. This new booklet explains the 11 important advantages of Republic high strength structural bolts, ASTM specification A-325, for quick, safe, lower-cost installation.

SILICONE PRODUCTS—New uses being developed for all silicones and new special-purpose products are covered in the 1955 Reference Guide issued by Dow Corning Corp., Midland, Mich. Twice the size of last year's, the catalog carries some 23 brand new products besides the 100-odd mentioned in the previous issue, listing them by 21 application classifications to facilitate locating a product by what it does rather than by what it is.

BEARINGS—Hyatt Catalog B-154 provides full information and specifications on the Hyatt line of dual-purpose self-aligning barrel bearings, said by the maker to lower maintenance costs by operating with full efficiency under misalignment conditions that cause excessive wear in ordinary bearings. From Hyatt Bearings Div., General Motors Corp., Harrison, N. J.

TEETH BUILDUP—24 x 36-in. wall chart has full-size illustrations of 23 different sizes of Manganal 11%-13½% manganese-nickel-steel wedge bars to simplify selection to properly fit any size or condition of worn tooth, either cast manganese steel or high-carbon steel. Also listed are dimensions and weights of Manganal 11%-13½% manganese-nickel-steel flat, round and square applicator bars, used to save welding time and expense in the replacement of metal worn away by impact and abrasion. Offered by Stulz-Sickles Co., Newark 5, N. J.

AIR COMPRESSORS—New 20-p Bulletin 201-C provides full information on the design and operating features of the Pennsylvania line of single-stage straight-line heavy-duty water-cooled air and gas compressors available in sizes from 10 to 125 hp and pressures up to 150 psi. From Pennsylvania Pump & Compressor Co., Easton, Pa.

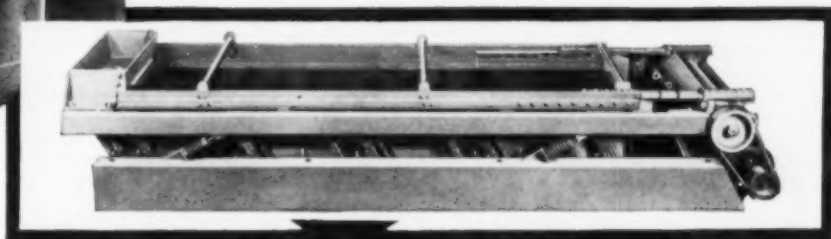


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S454

NEWS ROUND-UP

Anthracite Drainage, TVA Slash Budgeted by President

FEDERAL EXPENDITURES of \$5 million in the next 1½ yr for anthracite surface-water drainage, as the first part of a \$17-million program to be carried out jointly by the federal government and the Commonwealth of Pennsylvania, were called for in the annual budget message submitted to Congress by President Eisenhower Jan. 17. At the same time, the message recommended a 77% slash in new funds for the Tennessee Valley Authority and eliminated money for TVA construction of additional power capacity.

Recommended appropriations for the U. S. Department of Interior for the 1956 fiscal year, ending June 30, 1956, totaled \$560.1 million, a decrease of \$1.7 million from 1955. Total for the U. S. Bureau of Mines was \$18,863,000, against \$25,448,635 for 1955. Of the 1956 total for the Bureau, \$12,893,000 was recommended for conservation and development of mineral resources, against \$13,500,000 in 1955; \$5 million for health and safety, the same as in 1955; and \$970,000 for administrative expenses, slightly under the 1955 figure of \$1 million. A full comparison by items in the two years is not possible because of differences in budgeting methods.

In calling for legislation that would permit the federal government to share half the expense of the anthracite drainage program, the President asked that \$2 million be appropriated for use before June 30, 1955, and \$3 million for the next fiscal year. Bills to implement the program were immediately introduced into both the House and Senate.

The \$17-million program was recommended by the Pennsylvania Anthracite Mine Drainage Study Commission composed of representatives of the industry and the mines department. In its first report last April it asked that the entire \$17 million be provided from federal funds but in later reports agreed that the cost should be shared with the state. In its third and final report filed Jan. 17, the

commission recommended that the state Secretary of Mines be given condemnation rights and be permitted to take over underground coal holdings if necessary to carry out the drainage program.

In its Jan. 17 report the commission also reiterated its opposition to the \$400 million Conowingo mine drainage tunnel proposed by the U. S. Bureau of Mines as a solution to the region's problem. It called the Conowingo project both uneconomical and dangerous in recommending that it be given no further consideration. The surface-water program proposed involves backfilling of strippings, diverting of surface water by ditches and flumes and installing pumps at strategic locations. It would reduce the flow of surface water into mines by 20 to 25% and cut pumping costs by \$1½ million annually, the commission said.

While admitting that the TVA appropriations would fall short of providing the 7,490,000 kw TVA estimates it will need by 1958 to supply customers other than the AEC, the President's message indicated that the TVA must seek additional power from private sources, such as the much contested Dixon-Yates project, or find a way to build new facilities without new federal appropriations.

Coal, Gas Groups Agree On Underground Storage

Coal and natural gas industry groups in Pennsylvania have agreed on a program for the regulation of underground gas storage pools and were expected shortly to ask the Pennsylvania legislature for enabling laws, it was reported last month. The issue has been bitterly debated for several years and also is of serious concern to the two industries in other states. A coal-sponsored program passed the house in the 1953 legislature but was defeated in the senate.

Basically, the compromise program calls for the renaming of the state mines department to the Dept. of Mineral Industries, and creation of an Oil and Gas Div. under a deputy secretary. It provides for a drilling and plugging law covering gas storage under or within 2,000 ft of active coal mining operations, and requires storage operators to operate pools so that no gas can escape into coal seams. While it absolves them from Acts of God or acts of non-gas people, the proposed laws make storage operators responsible in any case where gas leaks



This mine is cooperating in the 1955 National Campaign to Prevent Accidents and Injuries From Falls of Roof, Rib, and Coal. We need your help to assure the success of the campaign. Each underground workman knows the hazards of mine roof and also knows how sudden and unexpected falls can be prevented. All that is asked of you is to take the steps that you already know when they are needed—without delay.

Your company supplies the roof supporting materials. It is up to the workman to use these materials promptly—when and where needed. The 1955 Campaign to Prevent Roof-Fall Accidents was not organized for anyone's "glory". It was originated by all segments of the industry to eliminate the greatest cause of mine fatalities. Success of the campaign will be measured by the effort YOU, PERSONALLY, put into this accident-prevention endeavor.

We are counting on you to help in protecting yourself from injury from any cause—especially from falls of roof, rib, or coal.

Resolve to work safely and STAY ALIVE IN '55.

Nationwide General Committee
1955 Coal Industry Campaign to Prevent Falls of Roof, Rib, and Coal Accidents

First Roof-Fall Poster

"WATCH THE ROOF" (above) went out early last month as the first poster to be made available in the recently announced nationwide 1955 campaign of the bituminous industry to prevent accidents from falls of roof, rib and coal. Stressing the worker's stake in exercising caution, the 11x17-in sheet was mailed to safety directors and other mine officials in charge of accident prevention, heads of state mine departments; local, district and state mining institutes, safety organizations and others. Additional copies are available from Harry Gandy Jr., NCA safety director, who is chairman of the general committee directing the cooperative campaign.

into a coal mine from an uncharted gas well.

In addition, the measure provides storage operators with the right of eminent domain to acquire wells for development of pools, but only where a company has acquired 75% of a gas sand that is at least 80% depleted. Operators of pools under unworked coal are to receive ample warning before development of the coal is to be begun. Under the plan, tight state control, sought by coal operators, will be exercised over testing of an area for possible development of a storage pool, considered one of the more dangerous aspects of storage.

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News Briefs and Trends

Hanna Shovel Sets New Record: 1,727,606 Yd in a Month

What is believed to be a new all-time record for overburden handling, 1,727,606 cu yd moved in 1 mo, was established in October by the 46-cu yd "A" shovel operating at the Georgetown No. 12 mine of the Hanna Coal Co. The earlier record of 1,522,154 yd in a month (published in *Coal Age*, October, 1953, in an article discussing Hanna's progress in dipper design, overburden preparation, maintenance, etc.) has since been consistently pushed upwards by both the "A" and "B" 46-yd shovels, according to company reports. In setting the new mark, the 46-A operated for 95.03% of the total available operating time of 697.5 hr, with travel time at 2.04% and the balance of 2.93% for mechanical and electrical maintenance. Average height of the highwall was 41.95 ft, with a maximum of 83 ft, and the machine traveled 4.68 mi. The figures show that the shovel made a productive pass once every 51 sec. A new record of 1,064 ft of highwall drilled in one shift, also established in October, was broken the following month when 1,203 ft was drilled in one 7¼-hr shift.

New-Type Miner for Low Seams, Small Mines

A new type of continuous mining machine specially developed to eliminate the high costs and low production of smaller mines operating in low seams has been invented by A. J. Wilcox, president of the Wilcox Coal Co., Daniels, W. Va. Built to mine coal from 24 to 40 in high, the "Wilcox Miner" is of a size and design that provides flexibility to "dodge" bone or rock partings found in many of the low seams in the area, thus producing a cleaner product that needs no preparation, the inventor reports.

Basically, the machine consists of two 24-in auger cutting heads with tungsten-carbide bits mounted on the perimeter and in a row across the face of each auger; two small screw conveyors to pick up coal falling on the floor; and a chain conveyor receiving coal from the augers and screw conveyors and discharging to a bridge-type conveyor. The two augers are adjustable to cut at different heights above or below a parting and are equipped with separately controlled reciprocators to eliminate binding in the coal. The miner sumps into the face similarly to a cutting machine and is pulled across the face by cables anchored to two jack pipes.

The first production model of the unit, which has been completed and is undergoing tests at the Wilcox mine in the Shady Springs District, Raleigh County, West Virginia, followed testing of the auger heads and of a complete experimental model. According to Mr. Wilcox, the miner is expected to be sold for less than half the cost of any continuous

miner now on the market and will equal tonnages of others under similar conditions. In tests, the machine is said to have produced 150 tons of clean coal per shift with a three-man face crew. The machine will be built by the Orelite Mfg. Co., Raleigh, and Mr. Wilcox is planning to organize a new company to handle its marketing.

Overland Belt to Try Again

Riverlake Belt Conveyor Lines, Inc., is again seeking state legislation that will enable it to build a 100-odd-mi overland belt conveyor between the Ohio River and Lake Erie to carry coal and iron ore. Bills to make conveyor lines public utilities, give them the same rights as common carriers and permit them to condemn land for a right-of-way were introduced as the Ohio legislature opened last month. The group backing the \$300-million project has tried unsuccessfully to obtain the right of eminent domain in two previous sessions of the legislature. Major opposition to the belt, which its backers say would cut transportation costs materially, has come from the railroads and railroad labor groups.

Kentucky Strip Law Reported To Be Working Smoothly

During the first 6 mo the new law regulating Kentucky strip mining was in effect, only one coal stripper refused to apply for a permit and post a bond. Henry Ward, chairman of the Kentucky Strip Mining and Reclamation Commission, has reported. The Company ceased mining in October when the commission

insisted that it secure a permit. Permits covering 1,293 acres have been issued to 75 operators, all those believed by the commission to be currently engaged in coal stripping in Kentucky. Bonds posted under the act to guarantee restoration of the land total \$130,100 and the 75 operators have paid \$16,470 in fees, which is being used for administration of the act. The commission's initial policy of working closely with the operators to determine reasonable and practicable reclamation programs has resulted in co-operative working relations with them, Mr. Ward pointed out.

Local Clinics Sought To Cut UMWA Fund Costs

A network of local union health centers in mining areas remote from city medical facilities is being sought by the UMW Welfare and Retirement Fund as a means of giving miners better care while reducing the hospitalization costs borne by the fund, it was reported Jan. 8. The proposed clinics would be financed locally by the miners themselves through checkoff from their wages, and the co-operation of two or more local unions would be needed in most areas. In addition to providing more general and specialized medical care to miners and their families in these areas, the clinics could be expected to screen out and treat cases which would otherwise be hospitalized at the fund's expense because local facilities were not available. Several such clinics reportedly have been in operation for some time but the fund is reported to be leaving the impetus for further development to local groups. It would provide supervision of such facilities, the advice of its central and regional offices, and even a loan of some money if necessary.

Southern Producers' Campaign Seeks 100% Accident-Prevention Training

A major 1955 safety campaign, with an eventual goal of 100% accident-prevention training for every worker and supervisor in the member mines of the Southern Coal Producers' Association, was announced Jan. 2 by James B. Benson, director of safety for the association.

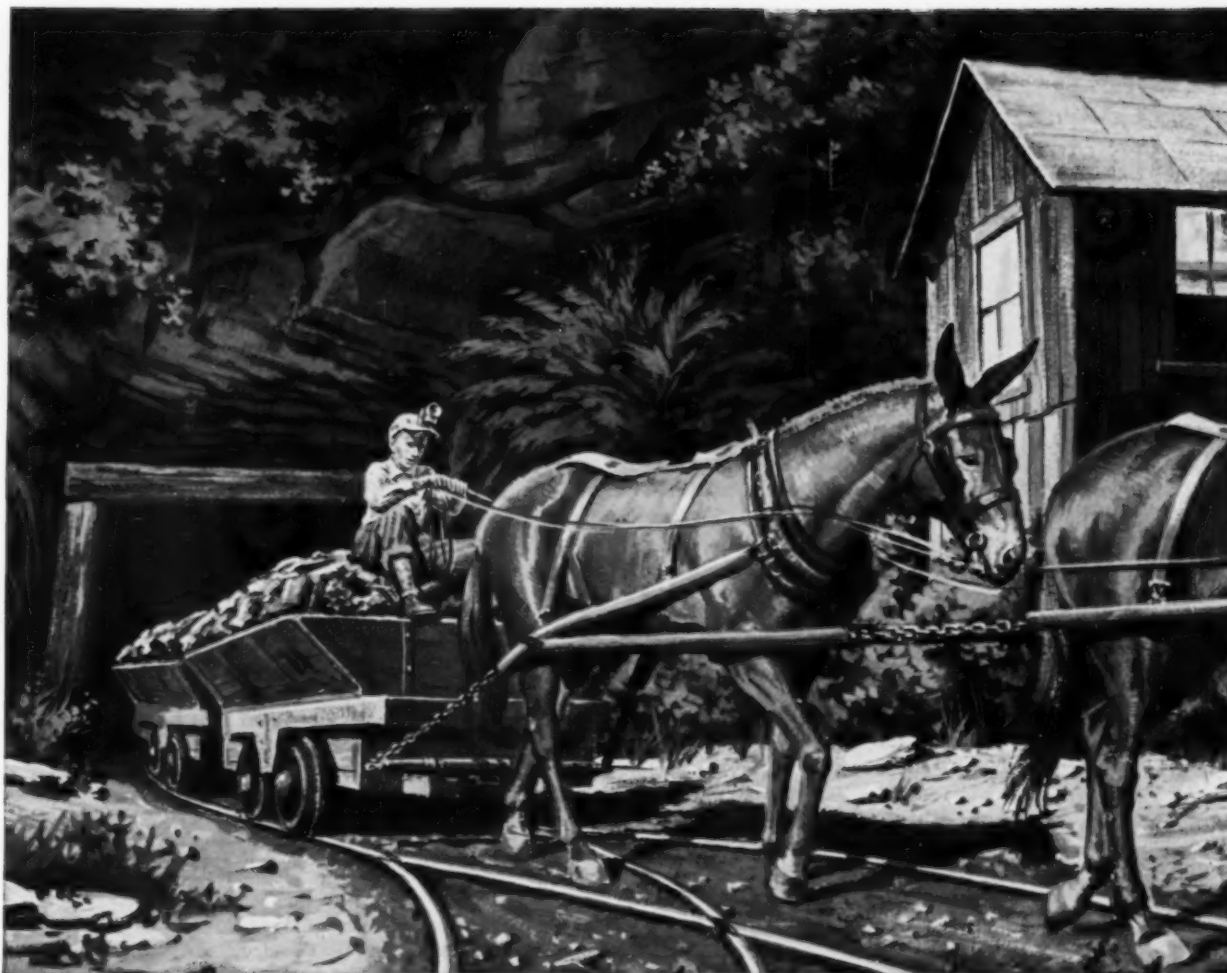
During the past year about 6,000 workers in Southern Coal's member mines completed the USBM 20-hr accident-prevention training course, Mr. Benson reported. A total of 19 mines were 100%, with every worker and supervisor completing the course. Training work will be stepped up in 1955 to the limit of available trained instructors, Mr. Benson emphasized, and the eventual goal is to have every miner and supervisor in all the association's membership mines 100% trained.

Pointing out that more than 90% of all mine accidents result from the "human factor," Mr. Benson said that "there is no question that accidents can be drastically reduced by proper safety training of the men and super-

visors." As an example, he cited one West Virginia mine which had shown startling proof during the past year.

"During the first 6-mo period there were four fatalities and 56 lost-time accidents at this particular mine," he declared. "Then 100% of the men completed the accident-prevention training course and during the following 6 mo there were no fatalities and only one lost-time accident."

In reviewing 1954 progress, Mr. Benson praised the workers and the local and national UMWA officials and federal and state mine officials for their co-operation in the safety activities. In the Southern Coal Producers' area, Mr. Benson reported, 5,200 men were given short courses in haulage or transportation safety, and 11,500 in roof-fall safety. While these figures are most encouraging, "we hope to do even better in the coming year," Mr. Benson said. Also prominent among the association's activities will be co-operation with the national safety campaign of the industry.



MUSCLES OF STEEL *put the mules out of business*

Oldtimers in coal mining can remember when mule-power was the only means of transportation in the mines.

Today's efficient coal mining demands big-capacity mechanized equipment. In modern underground mines, wire rope serves as *muscles of steel*—pulling cars from the loader to discharge point. In strip mining, also, wire rope provides the *muscle* for huge stripping shovels.

No matter what the job may be—wherever there's need for *muscles of steel*—it's a safe bet that Wickwire Rope is busy at work. In the mines and the quarries. In the logging camps and the oil fields. With the fishing fleets and in materials handling. In all of these fields, Wickwire Rope has a record of economical and dependable performance that can't be beat.

every industry benefits from wire rope

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Bureau to Study Piping Of Rocky Mountain Coal

The U. S. Bureau of Mines coal laboratory in Denver, Colo., July 1 will begin a project to study the feasibility of sending Rocky Mountain low-grade coals by pipe line to industrial areas. Dr. Louis C. McCabe, chief of the USBM Solid Fuels Div., worked out details of project at meetings in Denver with John H. East Jr., regional director, and V. F. Parry, head of the laboratory. Mr. Parry will have direct supervision of the study and experiments tentatively outlined on a 2-yr basis, and three engineers will be assigned to the initial phase of the project. Mr. Parry said it would probably be a year before the laboratory establishes an experimental pipe line. "Our first efforts will be to study theories, evaluate the properties of the various coals in the region and consolidate all available information on the subject." Three of the major aims of the project, Mr. Parry said, will be to determine the cost, special alloys needed for the pipe and the effects on the rail industry.

British Output Short of Goal

While 1954 British underground coal output increased by some 1,738,000 long tons over 1953, it fell more than 3 million tons short of the "reasonable minimum aim," a 2½% boost, agreed on by the National Coal Board and the miners' union in setting a pay increase last year. At the same time, open-pit coal production decreased by 1,454,200 tons to 10,243,900 tons, so that total production was 223,795,100 tons, a net gain of under 300,000 tons in 1954. Output per man

(Continued on p. 138)

NCA Committee Sparks Plan for More Coal Sales

The Market Promotion Committee of the National Coal Association Jan. 12 announced plans for a new program to increase coal sales, implementing the 1955 schedule of activities approved by the membership at the 37th anniversary convention in Pittsburgh last November.

M. L. Patton, vice president, Truax-Traer Coal Co., Cincinnati, and chairman of the NCA committee, said that the new program will center around a sales-engineering service aimed at increasing the installation of modern, clean, labor-free coal-heating systems in new commercial and industrial buildings, including schools and hospitals.

Included in the program will be a service for modernization of established coal-heating systems and the conversion of high-price oil and gas plants to low-cost coal operations, Mr. Patton reported. Details of the program will be announced in the near future.

"We have found wide favor among all segments of the industry—producers, wholesalers, retailers, railroads—in all coal-burning sections of the country for this kind of a program," Mr. Patton said. "We intend to get it moving just as rapidly as possible to service the in-



CHICAGO INDUSTRIALIST Col. Henry Crown, (left) is new owner of the Chicago, Wilmington & Franklin Coal Co. George B. Harrington (right), C.W.&F. developer and president for over 40 yr, becomes vice president of Materials Service Corp., now the parent company. Col. Crown also numbers among his holdings the Freeman Coal Corp. and New York City's Empire State Bldg.

Col. Crown Acquires C.W.&F. Properties

Acquisition of substantially all the stock of the Chicago, Wilmington & Franklin Coal Co., at a cost of approximately \$12 million, was announced Jan. 6 by Col. Henry Crown, chairman of the board of Material Service Corp., Chicago, which owns the Freeman Coal Mining Corp. An offer expiring Jan. 20 to purchase all of the remaining stock at \$25 per share, the same price paid the large company stockholders, also was reported.

The combined production of C.W.&F. and Freeman constitutes the largest coal production in the state of Illinois and ranks with the largest in the country. Both companies are presently operating three mines and produced about 3½ million tons each in 1954. Freeman and C.W.&F. have several of the country's most modern and efficient coal mines, and the two largest air-washing plants, which produce the best quality coal obtainable in the Mid West, the announcement pointed out.

George B. Harrington, C.W.&F. president for over 40 yr, will become a director and vice president of the Material Service Corp., Col. Crown reported. Known as a "Dean of the Coal Mining Industry," Mr. Harrington developed

Chicago, Wilmington & Franklin's mines personally, including the company's new No. 3 mine at Waltonville, Jefferson County, Ill.

Reporting that he planned to double production from C.W.&F.'s No. 3 mine, Col. Crown emphasized that he has confidence in the future of the coal industry. "We have modern, efficient mines which have every safety factor, and economically produce the highest quality coal. The demand for electric power is continually rising. It takes about a pound of coal to make one kilowatt of electricity, and from every viewpoint our coal is particularly adapted to electric utility use. We started in the building material business after the first World War and that business has always been very competitive. The construction outlook is particularly good for the next few years. On the other hand the coal industry is at its low ebb. It would be something of an accomplishment to take a company in an industry whose future is not so bright and, by complete mechanization coupled with hard work, turn that company into a real producer for the benefit of its employees and its stockholders."

creasing number of customers who have found that coal is the most reliable, economical and efficient fuel for heat and power when utilized in up-to-date coal-heating equipment."

Other members of the committee in charge of developing the new coal-marketing promotion program include: vice-chairman, R. L. Ireland, chairman, executive committee, Pittsburgh Consolidation Coal Co.; D. W. Buchanan Jr., president, Old Ben Coal Corp.; Frank A. Burke, director of sales, The Lorain Coal & Dock Co.; B. R. Gebhart, vice president, Chicago, Wilmington & Franklin Coal

Co.; Charles R. Griffith, president, Southern Coal & Coke Co.; R. W. Gruesser, vice president, Red Jacket Coal Corp.; S. P. Hutchinson, executive vice president, General Coal Co.; S. L. Jewell, vice president, Southern Coal Co.; George E. Owen, president, Imperial Coal Corp.; Earl C. Robertson, vice president, Poca-hontas Fuel Co., Inc.; Walter Rothenhoefer, vice president, Coal Div., Eastern Gas & Fuel Associates; R. E. Salvati, president, Island Creek Coal Co.; O. L. Scales, vice president, Enos Coal Mining Co.; and A. W. Vogtle, vice president, DeBardeleben Coal Corp.

INTRODUCING THE INTERNATIONAL DROTT 4-in-1 Skid Shovel



BULLDOZER—The bullclam is wide open and the rear of the bucket becomes the dozer. Depth of cut is regulated by forward and backward pitch of the blade.

Hydraulic Selector Lever Converts Latest Addition to **INTERNATIONAL DROTT** line into a...

- ① BULLDOZER ② BULLCLAM ③ SKID-SHOVEL ④ CLAMSHELL**

Here's the unit that answers every requirement for a single machine capable of handling a wide variety of jobs.

It's the NEW 4-in-1 multipurpose addition to the famed **INTERNATIONAL DROTT** Skid-Shovel line and it's available on **INTERNATIONAL TD-6** and **TD-9** crawlers.

The 4-in-1 can immediately be changed into a Bulldozer, Bullclam, Skid-Shovel or Clamshell by merely shifting the "shovel-selector" lever into the desired position. The lever is at the operator's finger tips, and shovel selection can be made whether the tractor is in motion or standing still. For fast loading of any material, the 4-in-1 can be operated either as a forward dump or bottom dump shovel.

Like all products in the **INTERNATIONAL DROTT** line, the new 4-in-1 reduces wear and strain on the tractor by transporting heaped loads on the exclusive Skid-Shoes. These same Skid-Shoes provide 300% greater break-out force than on competing shovels. There's the exclusive "Hydro-Spring" feature, too, that absorbs 70% of the shock normally encountered in front-end loaders for increased operator comfort and longer tractor life.

On specific earthmoving work such as excavating or loading the standard **INTERNATIONAL DROTT** Skid-Shovel is tops. But if you're looking for one machine to handle many jobs, the 4-in-1 is it.

For a demonstration, call your **INTERNATIONAL Industrial Distributor** today.

DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN
INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



BULLCLAM—By opening the clam 10 inches the cutting edge is lowered 2 inches. As the unit moves forward material boils into the bullclam.



SKID-SHOVEL—With clam closed, straight-forward loading of the shovel is accomplished by rolling the whole bucket forward to excavate. When filled it is rolled back over the Skid-Shoes to retain heaped load.



CLAMSHELL—Opening bullclam wide makes it possible to operate as a clamshell. Clam is brought down into material and closed by hydraulic pressure.

FREE—NEW 4-IN-1 CATALOG



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Gentlemen:
Please send the new 4-in-1 catalog to:

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Personal Notes

Henry Miller has been named superintendent of the Buckheart mine of the United Electric Coal Co., Canton, Ill., according to recent announcement by H. D. Pinkney, vice president in charge of operations. Prior to joining United Electric, Mr. Miller was general superintendent for Coleman Collieries, Ltd., Alberta, Canada.

E. B. Leisenring Jr. has been appointed assistant to the president of the Stonega Coke & Coal Co. and assistant vice president of the Westmoreland Coal Co., Philadelphia.

Several changes in the organization of the Island Creek Coal Co., under its program of modernization, expansion and diversification, were announced last month by Raymond E. Salvati, president. Russell W. Laxson, formerly vice president and comptroller, was appointed administrative vice president, responsible



Manages Inland Steel Mines

HARRY O. ZIMMERMAN has been named manager of Inland Steel Co. coal properties, headquartered at Wheelwright, Ky., it was announced Jan. 18. Formerly assistant to the manager, Mr. Zimmerman fills the vacancy caused by the death of John T. Parker on Jan. 12. He was chief engineer for 24 years, starting in that capacity with the company when it acquired its first coal property at Wheelwright in 1930. Active in many coal organizations, Mr. Zimmerman is a vice chairman of the AIME Central Appalachian Section and a member of the Kentucky Mining Institute, the Big Sandy-Elkhorn Coal Mining Institute, the Kentucky Society of Professional Engineers and the Kentucky Water Pollution Control Committee. He also has been a member of the advisory committee of the BCR Mining Development Committee.

for business activities in the Huntington office and also in charge in Mr. Salvati's absence. James L. Hamilton, vice president in charge of operations, continues in that capacity, supervising all Island Creek and Pond Creek operations and reporting directly to Mr. Salvati. A. L. Lynn, vice president of merchandising, was named vice president of planning and development, responsible for long-range planning for company growth, research and reserves planning. His former merchandising responsibilities have been assigned to Carlton R. Mabley Jr., vice president of sales. William C. Nelson, formerly assistant to the president, was appointed vice president of production planning, with responsibility for profit planning, operating planning and schedules, plus traffic and shipping in the general office. F. C. Honchell is now comptroller in charge of all accounting.

The appointment of J. S. Whittaker as general superintendent of operations of the Pittsburgh Coal Co., Div. of Pittsburgh Consolidation Coal Co., Library, Pa., was announced late in December by Henry C. Rose, president. Named to succeed Mr. Whittaker as director of safety was C. W. Parisi, formerly mine foreman of the company's Montour No. 10 mine.

Glenn E. Sorensen, president of the Kemmerer Coal Co., Frontier, Wyo., and an official of several affiliated companies, has also been elected president of the Gunn-Quealy Coal Co., Quealy, Wyo. He formerly was vice president of Gunn-Quealy, a Kemmerer affiliate.

William M. Mobley, for many years chief chemist and research director of the Alabama By-Products Corp., Birmingham, has been appointed technical director, heading the company's newly created Technical Control and Research Dept. According to P. H. Neal, Alabama By-Products president, who made the announcement, the new department has been established to integrate and enhance the quality control, laboratory, technical coal preparation and research activities of the company; continue its program of product development; and better provide customers with exact, controlled quality needed for special use and specialty products. Among other duties, the new department will supervise the company's experimental cupola, the only production-sized cupola in the country operated by a commercial foundry-coke producer for quality-control testing.

The appointment of John A. Phinney as research manager, Research and Development Div., Pittsburgh Consolidation Coal Co., Pittsburgh, has been announced by E. H. Reichel, director of the division. Mr. Phinney joined Pitt Consol in 1948 and has been chief process engineer in coal conversion with the research department. A holder of a master's degree in chemical engineering from MIT, Mr. Phinney formerly was with Standard Oil Co. (Ind.) and the Stanolind Oil & Gas.

Union Official Heads Penn. Mines Department

The appointment of Joseph T. Kennedy, Wilkes-Barre, Pa., as Pennsylvania Secretary of Mines in the incoming Democratic state administration was announced Jan. 12 by Governor-elect George M. Leader. Mr. Kennedy, who succeeds W. J. Clements in the \$15,000-a-year cabinet post, formerly was executive assistant to Thomas Kennedy, UMW international vice president. They are not related. The new appointee was recommended by Thomas Kennedy and by seven UMW District presidents.

Now 51, Mr. Kennedy first went to work in the mines in 1916 and was an official in Local 20 of Hudson Coal's Loree colliery. He served as secretary to the president of UMW District 1 from 1929 to 1937, when he became statistician for the district. He was named secretary to Thomas Kennedy in 1945, becoming executive assistant in 1948. Mr. Kennedy attended Wilkes-Barre Business College and was graduated from the University of Scranton, where he majored in statistics, education and business law.

In announcing the appointment, Mr. Leader described Mr. Kennedy as a man who "fits the job like a glove" and said that he was impressed with his wide knowledge of the technical aspects of the mining industry. "I have had a number of appeals from mining men to select a mines secretary of his caliber," Mr. Leader reported.

Obituaries



JOHN T. PARKER

John T. Parker, 53, manager of Inland Steel Co. coal properties at Wheelwright, Ky., died suddenly Jan. 12 in Cleveland Clinic, Cleveland, Ohio, of acute leukemia. He had entered the clinic Jan. 7, a few days after the first appearance of symptoms of the illness. Long prominent in the coal industry organizations, Mr. Parker was at his death a member of the BCR Mining Development Committee, the operating committee of the Bitumi-

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Tests prove new Sinclair HEAVY DUTY BEARING GREASE gives better lubrication . . . longer life to bearings. It is specially compounded to *stay put* in heavily loaded, slow speed rotating or sliding bearings. You'll find it has an exceptionally high load-carrying capacity . . . greater resistance to melting out.

Try it—for longer bearing life . . . higher productivity . . . lower operating costs.

A Sinclair Lubrication Engineer can give you expert counsel on how you can get the most out of your equipment with Sinclair's new HEAVY DUTY BEARING GREASE. Phone your local Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

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HEAVY DUTY BEARING GREASE



HEAVY DUTY





SUPERVISORS cited for safety at Harman-Feds Creek meeting were: Ted Ratliff (seated, left), tippie foreman; Robert Wilson, general mine foreman; and Millard Carroll, superintendent, Feds Creek Coal Co.; and Fred Riggsby (standing, left), motor boss; Pete Carter, shop foreman; Frazier Fletcher, Dave Lockart and A. W. Vance, section foremen, all of H. E. Harman Coal Corp.



OFFICIALS of the H. E. Harman Coal Corp. and Feds Creek Coal Co. and visitors at the companies' safety meeting included: Seated—E. N. Harris Jr. (left), comptroller; Henry Altizer, mine foreman; Walter Allen, federal mine inspector; J. L. Gilley, chief, Norton (Va.) office, USBM; Ray Campbell, mine inspector, Underwriters' Safety & Claims; and I. J. Richardson, president and general manager of both companies. Standing—P. H. Schindler (left), general manager, Underwriters' Safety & Claims; R. V. Venable, general superintendent; Ted Osborne, assistant general superintendent; C. B. Stergel, general mine foreman; M. J. Farmer, purchasing agent; Elbert Asbury, safety engineer;

Harman-Feds Creek Present Safety Awards

TOP HONORS at the annual safety meeting held Dec. 11 by the H. E. Harman Coal Corp., Harman, Va., and the affiliated Feds Creek Coal Co., Big Creek, Ky., went to Frazier Fletcher, section foreman, who received a large-size cup for supervising men for three consecutive years without a lost-time accident among his crew members.

I. J. Richardson, president of the two companies, made the presentations. Medium-size cups for 2-yr records went to Fred Riggsby, of Harman, and Ted Ratliff, of Feds Creek. One-year cups were awarded to W. R. Wilson, Feds Creek, and to Pete Carter, Dave Lockart, A. W. Vance and Woodrow Dailey, Harman. For general effort in promoting good

safety, Mr. Richardson awarded cups to E. B. Stergel and Henry Altizer, general foremen.

P. H. Schindler, general manager, Underwriters' Safety & Claims, Louisville, Ky., made appropriate awards to the three groups of men. Ray Campbell, mine inspector for Underwriters' Safety & Claims, presented and analyzed statistics on accidents and their costs for the two mining companies for the insurance year ending Aug. 31, 1954. Other visitors at the meeting included Walter Allen, federal mine inspector; J. C. Gilley, chief, Norton office, USBM; C. R. Coombs, claims manager, Underwriters' Safety & Claims; and J. H. Edwards, associate editor, *Coal Age*.

OBITUARIES From p 128

nous Coal Operators' Association and the program committee for the 1955 American Mining Congress. He was a past president and director of both the Kentucky Mining Institute and the Big Sandy-Elkhorn Mining Institute and had been chairman of the AIME Appalachian Section.

Mr. Parker was first employed by Inland in 1926 as a mining engineer at Indianola, Pa., but he was transferred 4 yr later to its operations at Wheelwright, where he was successively mine engineer, mine superintendent and general superintendent before becoming manager just 1 yr ago.

Thomas R. Lewis, Wyoming, Pa., president of the West Exeter Coal Co. and Dial Rock Coal Co., died Jan. 13 at his home following an illness of several years.

Layman C. Webb, 50, master mechanic and chief electrician at properties of the Jewell Ridge Coal Corp. in Tazewell and Buchanan counties, Virginia, died Jan. 13 in a Richlands, Va., hospital after a brief illness. Mr. Webb had been associated with Jewell Ridge since 1940.

Ernest W. Davis, 64, director of engineering for the Simplex Wire & Cable Co., Cambridge, Mass., died Jan. 11, following a heart attack. He joined Simplex in 1913 2 wk before graduation from MIT and was assistant electrical engineer until 1932, when he was made chief electrical engineer. Later he became chief engineer and was named director of engineering in 1950.

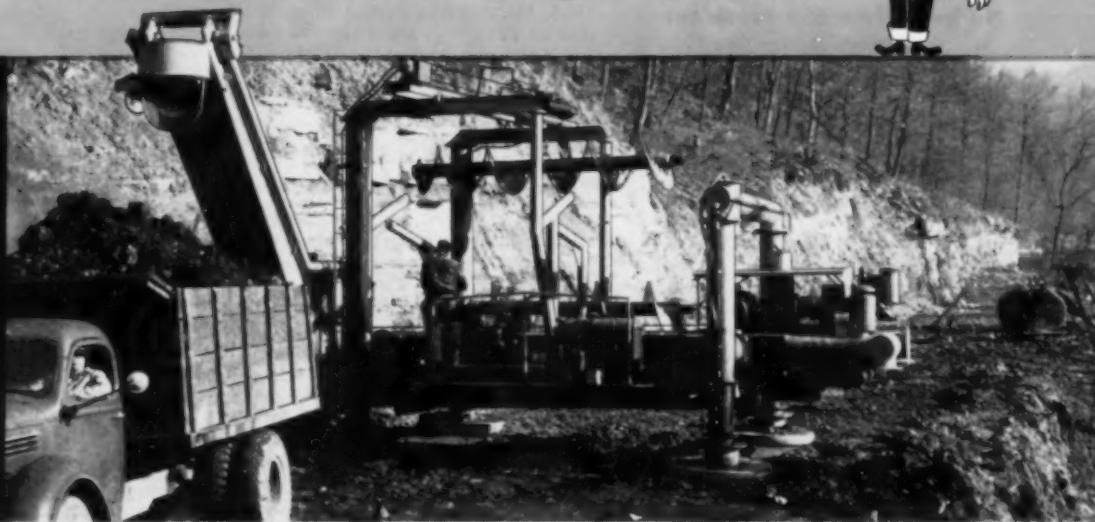
Safety Code Standard for Mines Selling Coal to Government

The Secretary of Labor now will be guided by the Federal Coal Mine Safety Code, or by higher state standards of health and safety, to determine compliance of coal mine operators with the Walsh-Healy Public Contracts Act. The act requires contractors furnishing coal or other supplies to the federal government to stipulate that no part of the work will be performed in surroundings or under working conditions which are "unsanitary or hazardous or dangerous to the health and safety of employees" engaged in performance of the contract, and provides that persons or firms violating the stipulation may be barred by the Secretary of Labor from further government awards. Use of the code as standard was accomplished by amendment of the Walsh-Healy Act rulings and interpretations published in the Federal Register Dec. 24. As the first step in setting minimum hourly wages for the bituminous industry under provisions of the Walsh-Healy act, Secretary of Labor James P. Mitchell has called a public hearing to be held in Washington Feb. 1. Determination of minimum wages, as well as establishment of minimum safety standards, will affect suppliers of coal to the TVA, some of whom, it has been charged, are not paying prevailing industry wages.

SMALL but **MIGHTY!**



**The
all
new**



Compton Budget Model 28 Coal Auger

Ideal for narrow pits and short benches

Here it is! The mighty mite of the Compton Coal Auger family—Model 28—designed, like its big brothers, to raise production figures and cut operating costs—This new machine will produce up to 50 tons per hour. Only 28 feet long, light weight and easily

moved from pit to pit with optional available tail wheel assembly, this Compton Coal Auger enables a 3 man crew to efficiently handle tough mining assignments in pits and/or benches as small as 30 feet—augering to a depth of 150 feet.

Model 28 incorporates many of the time-proven features found only in Compton Coal Augers:

- 1 Model 28 with all size cutting heads drills coal within 4¾" of the bottom—assuring maximum recovery.
- 2 Easily accessible auger sections racked on the frame.
- 3 Elevating conveyor is integral part of the machine.
- 4 Hydraulic jack legs (with self-leveling pontoons) allow drilling up to 150 feet without misalignment.
- 5 Single or vertical overlapping holes can be drilled for greater recovery.
- 6 Easy to move along working face of highwall.

It will pay you to look into the advantages of the Compton Coal Auger. A Compton representative will help you review your property for the proper auger application.



GENERAL SPECIFICATIONS MODEL 28

Length: 28 feet
Weight: Approx. 25 tons
Carries ten—12½ ft. auger sections
Required pit width: 30 ft. min.
Power: 150 hp Diesel engine
Hydraulic Frame Jack Lift: 54 inch
Auger Diameter: 44" to 28"
Max. Drilling Depth: 150 feet
Cutting Head: Compton non-clogging type with built-in spider bearing assembly provides straighter drilling with less frictional drag.

Compton, Inc.
ORIGINATORS OF COMPTON LUMP RECOVERY HEADS

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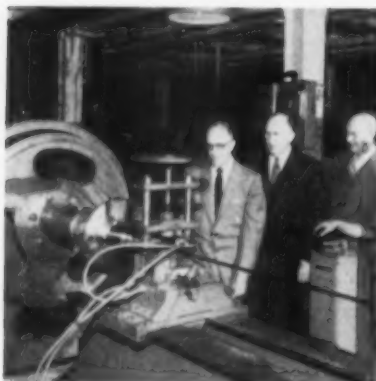
Among the Manufacturers

Norberg Now ESB President

Electric Storage Battery Co., Philadelphia, has elected Carl F. Norberg, president, following the resignation of S. Wyman Rolph, president, chairman of the board and a director, retiring after 38 yr of service. Mr. Norberg joined Willard Storage Battery Co., then a subsidiary of Electric Storage Battery, in 1925, shortly after he came to the United States from his native Sweden, and held a succession of positions until 1941 when he became vice president in charge of manufacturing. He was transferred to the Electric Storage Battery Co. in 1943 and the next year was made vice president in charge of manufacturing, becoming executive vice president in 1950.

U. S. Steel Promotes Darby

J. Douglas Darby has been appointed assistant executive vice president—commercial of U. S. Steel Corp., Pittsburgh, Pa. Succeeding Mr. Darby as vice president and general manager of sales is Marcus J. Aurelius, vice president of sales of the U. S. Steel Columbia-Geneva Div. since 1950. Prior to joining the sales department of United States Steel in 1939, Mr. Darby was associated with the Alan Wood Steel Co. in various positions in his 20 yr of service there. He came to Pittsburgh in 1945 as general manager of sales and was made vice president of sales in



Wire Rope at High Speed

INSTALLATION of a new high-speed tube-closing machine that will produce wire rope at a rate of 6,000 ft or more per hour has been reported by the American Chain & Cable Co. at its plant in Wilkes-Barre, Pa. Company officials watching as the 8-ton unit began operation were E. H. Todd (left), sales manager, wire rope divisions; E. S. Wellhofer, assistant plant manager; and G. C. Gregson, plant manager. The new equipment, balanced to operate with the precision of a watch, will increase the company's shipments of wire rope and wire rope slings. It can produce ropes larger than $\frac{5}{8}$ in at an even faster rate of speed.

1948. Mr. Aurelius started his steel career in 1931 with the Colorado Fuel & Iron Co. and served as their Chicago district sales manager. He joined United States Steel in 1937 as a salesman and later became a sales engineer and assistant manager of sales.

Russell Joy Vice President

John D. Russell, formerly manager of engineering, Joy Mfg. Co., has been appointed vice president, engineering, with headquarters at Joy's executive offices in Pittsburgh. Mr. Russell has served Joy in various engineering capacities since his graduation, with a degree in electrical engineering, from Cornell University in 1930.

NMS Names Sales Manager

National Mine Service Co., Pittsburgh, has appointed W. C. Campbell general sales manager. Since 1953 he had been sales assistant to the president. Joining the company in 1947 as manager of the newly organized Joy department, Mr. Campbell was transferred from Beckley, W. Va., to Indiana, Pa., in 1952, where he served as manager of mining sales of the company's Whiteman Div.

Ryerson Advances Two

Joseph T. Ryerson & Son, Inc., Chicago, has appointed Weaver E. Falberg general manager of sales, and John A. Houston assistant general manager of sales, for the firm's nation-wide group of 16 plants. Mr. Falberg has been with

(Continued on p 158)

MEETINGS

AIIME Annual Meeting, Feb. 14-17, Conrad Hilton Hotel, Chicago.

American Power Conference: 17th Annual Conference, March 30-April 1, Sherman Hotel, Chicago.

American Mining Congress: Coal Convention and Exposition, May 16-19, Cleveland, Ohio.

Rocky Mountain Coal Mining Institute: 51st Annual Meeting, June 26-29, Colorado Hotel, Glenwood Springs, Colo.

Power Meet to Discuss Atomic Energy Progress

A discussion of the progress being made to harness nuclear energy for mass production of electric power will be one of the highlights of the 17th annual American Power Conference March 30-April 1 at the Sherman Hotel, Chicago. Participating in the forum will be representatives of several utilities active in the development of nuclear plants for central-station power production.

Sponsored by Illinois Institute of Technology in co-operation with 14 leading universities and nine national and local engineering societies, the conference will include 30 sessions covering almost all phases of the power industry.

Session topics include efforts to capture usable energy from the sun's rays, steam generators, steam and gas turbines, electronic computing devices, water technology and its industrial applications, and the generation, transmission, distribution and utilization of electricity.



COAL MEN ON THE JOB . . .

GUYAN EAGLE COAL CO., Mine No. 1, Amberstdale, Logan County, W. Va.: Seated—H. B. Furgeson (left), general superintendent for the company; Vasco Messinger, section foreman; J. M. Doss, general mine foreman; Ted Barrs, night chief electrician; Ivan Trogon, section foreman; Millard Bellomy, dispatcher; and Bill Bauer, section foreman. Standing—Ed Adkins (left) timekeeper; John Marushl, section foreman; Tom Grubb, section foreman; Lynn Leslie, general night foreman; Jimmie Smith, section foreman; Luther Preston, assistant to general foreman; Clay Stowers section foreman; Arnold Baldwin, section foreman; and Harry Smith, chief electrician.



Bottom-Dump Coal Haulers have capacities of 25, 32 and 40 tons... engines from 190 to 300 h.p.... dual or large single drive and trailer tires... torque converter and Torqmatic drive or standard transmission.

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GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Higher Availability More Tonnage Lower Costs

On scores of mining operations all over the world the high job availability of Euclid equipment results in more tons hauled per shift. Because they're engineered and built for the toughest off-the-highway service, "Eucs" stay on the job longer, with less time out for servicing and repairs.

Dependable low cost hauling has made Euclid the preferred equipment for open pit operations in both the bituminous and anthracite fields. If you're interested in cutting your hauling cost for coal, overburden or waste, have your Euclid distributor prepare a production and cost estimate for your operation. There's a good chance he can show you how to haul more tonnage at lower cost.



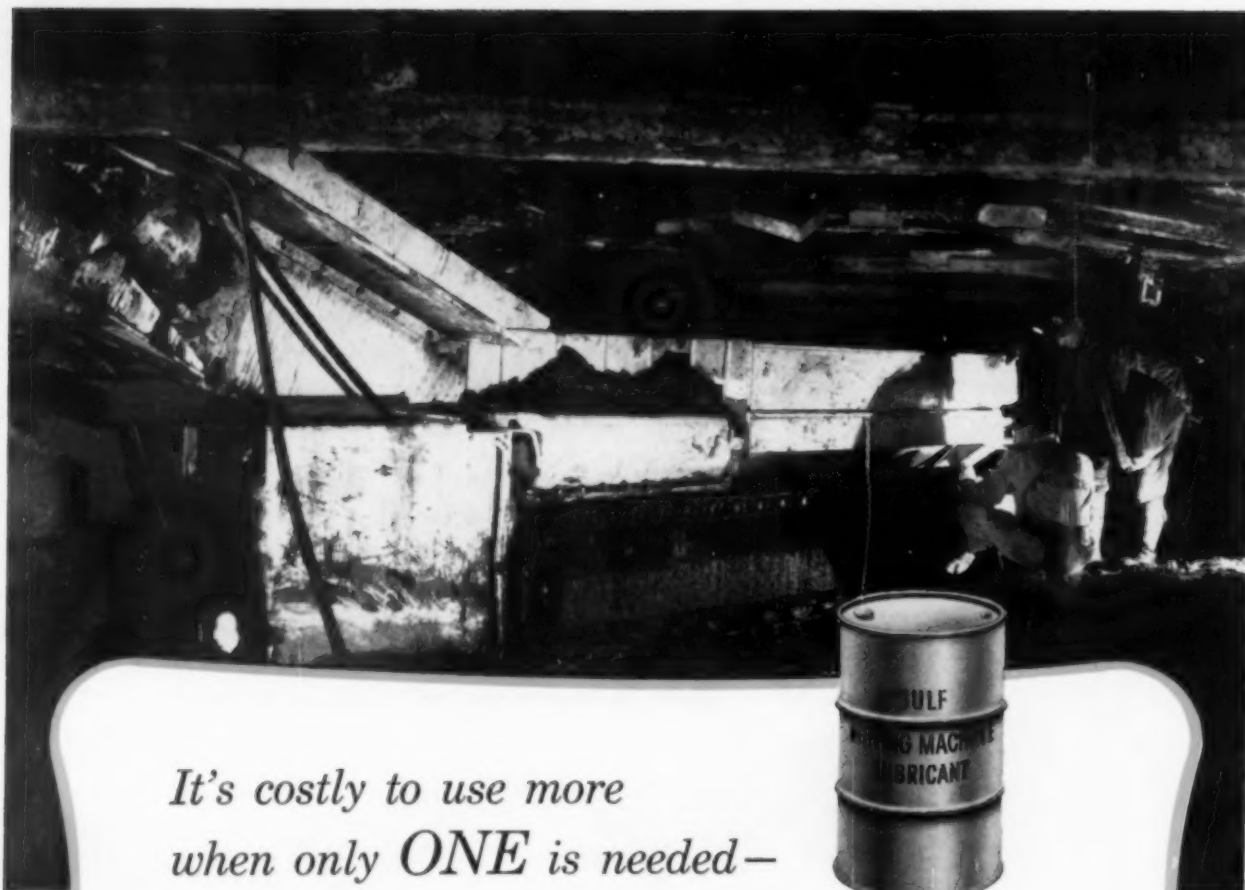
Rear-Dump models are available in 10, 15, 22, 34 and 50 ton capacities with engines of 165 to 600 h.p.... semi-rigid or spring mounted drive axles... standard transmissions or torque converters and Torqmatic drive.



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





*It's costly to use more
when only ONE is needed—*



Gulf Mining Machine Lubricant

When you can simplify your lubricant storage and handling, stop application errors, and secure better protection with one lubricant, why use more? You can gain all these cost-saving benefits for most types of mining equipment by switching to Gulf Mining Machine Lubricant. It can often do the entire lubricating job at the face, a task which otherwise requires three or more different lubricants.

This exceptional lubricant is effective for pressure fittings, plain and antifriction bearings,

crawler mechanisms, and gear boxes. It not only replaces several other lubricants but does an outstanding job because of its heavy body, excellent adhesiveness, and resistance to the washing action of water.

Why not have a Gulf Sales Engineer demonstrate the time-saving, cost-cutting advantages of Gulf Mining Machine Lubricant on your equipment? Contact him today at your nearest Gulf office. Gulf Oil Corporation • Gulf Refining Company, 1822 Gulf Building, Pittsburgh 30, Pa.



THE FINEST PETROLEUM PRODUCTS FOR YOUR EVERY NEED

Association Activities

Illinois Coal Operators Meet

At its 25th annual meeting held Dec. 15, in Chicago, the following members were elected to the executive board of the Illinois Coal Operators' Association: Stuart Colnon, Otto Gressens, George B. Harrington, Frank F. Kolbe, George C. McFadden, Thomas C. Mullins Jr., A. H. Truax and William P. Young. Mr. Kolbe was named chairman of the board. The following officers were then elected by the board: president, A. H. Truax; secretary, Fred S. Wilkey; and treasurer, C. W. Peterson.

Mauck Heads Pocahontas Group

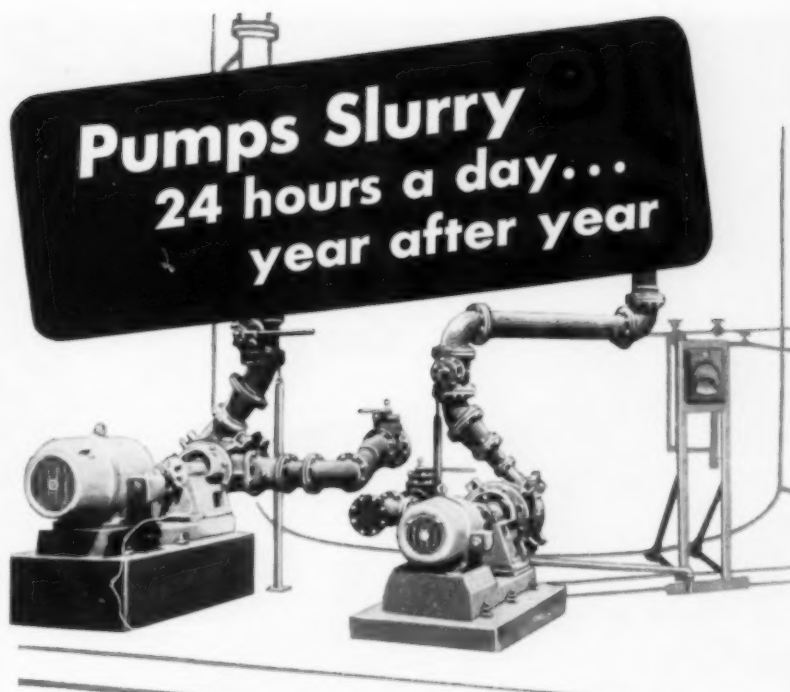
H. E. Mauck, general superintendent, Olga Coal Co., Coalwood, W. Va., was elected president of the Pocahontas Electrical & Mechanical Institute at its meeting held recently at Bluefield, W. Va. Other officers include: J. W. Pero, production manager, Pocahontas Fuel Co., first vice president; S. S. Cooper, chief electrician, American Coal Co., second vice president; J. B. Wooldridge Jr., secretary; and B. B. Housman, treasurer.

Chapman Heads Personnel Men

J. S. Chapman, assistant to the manager of coal mines, Armco Steel Corp., has been elected president of the Association of Mining Personnel Officers succeeding John J. Yorke, personnel director, Island Creek Coal Co. Other new officers named include: H. E. Mauck, vice president; E. R. Templeton, secretary; and Tom Waddington, treasurer. Retiring officers are: J. S. Chapman, vice president; R. E. Shelton, secretary; and H. C. Fulton, treasurer.

Institute Elects Sizemore

At a recent meeting of the institute's executive committee, David C. Sizemore, superintendent, Cranberry mine, New River Co., was elected president of the New River & Winding Gulf Electrical, Mechanical & Mining Institute, succeeding C. O. Carman, superintendent, Statesbury No. 8 mine, Eastern Gas & Fuel Associates. L. L. Fleshman, superintendent, Slab Fork Coal Co., was named first vice president, and J. A. Baritell, general superintendent, MacAlpin Coal Co., was elected second vice president. W. W. Ford, Appalachian Electric Power Co., was re-elected secretary-treasurer of the organization. Members of the executive committee include: M. K. Clay, Waldo LaFon, John Wood, N. G. Weaver, James Bowyer, F. K. Hays, J. A. Baritell, Luther Fink, Milton Honts, F. J. Gallagher, C. O. Carman, D. C. Sizemore, Richard Jones, E. A. Rickard, L. L. Fleshman and Allen Garrett Jr. The executive committee awarded an honorary life membership in the institute to M. K. Clay, chief electrician, Gulf Mining Co. Mr. Clay, elected president when the institute was first formed in 1932, has served the institute almost continuously, most recently as its secretary-treasurer. He declined to be re-elected last year in the secretary's post,



● MORRIS TYPE R SLURRY PUMP at the left is on continuous 24-hr. duty delivering 1000 GPM of a 170° lime slurry at 100' head. Fifty-HP motor operates at 1180 RPM. Intermittent-duty pump at right delivers 200 GPM at 50' head with 7½-HP motor turning at 880 RPM.

In slurry-handling operations, "long-term service" is a meaningless claim unless the pump will work day-in and day-out with a minimum of maintenance time, trouble and expense.

Morris Type R Slurry Pumps—with an established reputation for longer life—also incorporate in their design exclusive features which result in easier installation . . . fewer interruptions to service...less overhaul...fewer replacements.

To provide uninterrupted service . . .

The gland is under suction pressure only. This reduces leakage and dilution . . . keeps harsh abrasives out of the stuffing box . . . practically eliminates packing troubles.

There are no internal studs or bolts. Caustic and corrosive solutions cannot seep past threads and cause maintenance headaches.

To make installation and dismantling easy . . .

Shell is interchangeable for right or left hand rotation. Suction and discharge nozzles can be rotated around the axis of the pump to a total of 72 different locations.

Impeller removed without disturbing the piping. You simply loosen 4 outside clamping bolts and pull off the end cover. This feature alone saves considerable time and labor.

● **Free Service.** Morris Engineers will be glad to recommend the pump best suited to your needs for size, capacity, etc. Send necessary data today . . . include request for Bulletin 181.

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MORRIS Centrifugal Pumps



with Transite* Mine Service Pipe

MINE OWNERS AND OPERATORS know from experience that frequent pipe replacements due to corrosion can be a costly factor in mine operation. During the past 20 years they have been finding a solution to this problem in tough, durable Transite Mine Service Pipe. Made of asbestos, cement and silica by a special process, this pipe stubbornly resists corrosion . . . from the inside and from the outside.

Transite Pipe has other advantages important to mine operations. Light in weight, it is easy to handle . . . tight "factory made" couplings make installation easy. It is tough and strong . . . its flexible couplings enable lines to be laid around curves . . . often without the use of fittings, a big advantage in restricted mine passages.

SUCCESSFULLY HANDLES MANY MINE JOBS

For Mine Drainage, Transite Mine Service Pipe has an exceptional record of corrosion resistance that has enabled it to stand up for extended periods under conditions that have quickly destroyed ordinary pipe.

For water supply lines, Transite's unusually high carrying capacity and its immunity from tuberculation keep pumping costs at a minimum.

For other services, where a tough, durable and easily installed pipe is required, Transite Pipe is contributing important economies.

For further information write for Brochure TR-51A. Address Johns-Manville, Box 60, New York 16, N.Y.



*Transite is a Johns-Manville registered trade mark

Johns-Manville TRANSITE MINE SERVICE PIPE

EQUIPMENT APPROVALS

Seven approvals of permissible equipment were issued by the U. S. Bureau of Mines in December, as follows:

Jeffrey Mfg. Co.—Type 34F52 continuous miner; one 15- and one 75-hp motor, 250 v, DC; Approval 2-888A; Dec. 15.

The Long Co.—Joy 12BU-9E loader—Long PT Piggyback conveyor combination; four 4-hp motors on Joy loader, one 4-hp motor on Piggyback, 250 v; Approval 2-1026; Dec. 14.

Ensign Electric & Mfg. Co.—Type LGG distribution box; one 600-amp and two 100-amp, 250-v DC breakers; Approval 2-1027; Dec. 22.

Joy Mfg. Co.—Type 20BU3-1E bridge conveyor loader; two 22-hp motors, 250 v; Approval 2-1028; Dec. 29.

Joy Mfg. Co.—Types 55C7BPE-2 and 55C7BPXE-2 cable-reel shuttle cars; two 10-hp and one 7½-hp motor on each, 250 v, DC; Approval 2-1029; Dec. 29.

Joy Mfg. Co.—Types 95C1PE-1 and 95C1PXE-1 cable-reel shuttle cars; one 15-hp and two 10-hp-motors on each, 250 v, DC; Approval 2-1030; Dec. 30.

Caterpillar Tractor Co.—Type D4 diesel-driven tractor with 4S bulldozer for non-coal mine service; Approval 2404; Dec. 16.

but has maintained his interest by service on the executive committee.

No. Illinois Assoc. Meets

Officers re-elected at the annual meeting of the Northern Illinois Coal Trade Association, Chicago, Jan. 10, included: president, J. M. Morris, vice president, United Electric Coal Cos.; vice president, William H. Cooke, president, Little Sister Coal Corp.; and secretary, A. J. Christiansen. Harry M. Ziv, vice president, Walter Bledsoe & Co., was elected treasurer, succeeding the late T. C. Mullins. Succeeding Mr. Ziv on the board of directors was T. C. Mullins Jr., president, Midland Electric Coal Corp. Also elected to the board was Ray F. Barrow, assistant to the executive vice president of the Southern Coal Co., Key Coal Co. and Northern Illinois Coal Corp.

Correcting the Record

In a discussion of haulage at the Williams mine in the report on pp 56-63 of the January, 1955, issue of *Coal Age*, reference was made to the use of electric throws for switches. The report should have noted that a number of Canton "Electri-Throw" switch throwers, a product of the American Mine Door Co., are incorporated in the switch and signal system.

.... all in a day's work!



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BUCKET IS BUILT FOR THE JOB!**

After 8 years the bucket shown in the photo above is still on the job and going strong. The "RH" class is designed for digging in blasted rock, shale, compacted gravel, and hardpan, so we give it ample weight to insure penetration, and heavy toothpoints mounted in bases cast integral with the high-manganese steel lip to withstand the abrasion and strain it is expected to meet. Other standard classes available are the "RC" general purpose, "RM" medium, and "RL" light. Write Dept. "E" for bulletin GPB 454.

PAGE ENGINEERING COMPANY - CLEARING POST OFFICE - CHICAGO 38, ILLINOIS

Page Engineering Company has designs, facilities, and experience, to build special purpose buckets such as slat — trenching — levee — and vee bottom to meet YOUR needs. Capacities — $\frac{3}{8}$ to 40 cu. yds.

Page

**Automatic Dragline Buckets
Diesel and Electric
Walking Draglines**



These workers need the protection of their heavy durable work clothes. The cables that provide power for their tools need extra protection too. In more and more mine operations this means covering all electric cables with Ruberoid Insulating Tape.

Ruberoid Insulating Tape means longer cable life. It's a rugged asphalt tape, with adhesive on both sides providing a viselike grip that won't tear or ravel...it's acid and alkali proof

...it insulates with one layer because it's extra thick. Ruberoid Insulating Tape exceeds ASTM specifications by 40% in adhesiveness, 25% in tensile strength and 110% in dielectric strength.

To cut down on down time due to cable failure, check the advantages and economy of Ruberoid Insulating Tape. See your nearest Ruberoid dealer or write The Ruberoid Co., 500 Fifth Avenue, New York 36, N. Y.

The RUBEROID Co.

ASPHALT AND ASBESTOS BUILDING MATERIALS

NEWS From p 126

was slightly higher in 1954, the preliminary figures showed, since the labor force of about 700,000 was slightly under that of 1953. Import of \$2½ million worth of American coal, the first under the MSA program administered by the FOA, is provided for under an agreement signed by the U. S. and Britain Dec. 28. The coal will be paid for in sterling, which will be used by the U. S. for military goods or for aid to other countries.

British Coal Board Pays Employees for New Ideas

Awards valued at more than \$8,400 have been made to six National Coal Board employees on the recommendation of the British Industry's National Awards Tribunal, which assesses the value of original inventions in the technical field. During the 3 yr the scheme has been operating more than 200 payments totalling about \$16,800 have been made by the local division panels, which have the power to award up to \$280. Some 30 inventions coming before the National Tribunal have been awarded sums totalling \$49,000. Objective of the program is to encourage the Board's employees to bring forward inventions having a useful application within coal mining and ancillary activities, and inventors appearing before the tribunal and panels have come from every level of the industry. Ideas can be brought forward at an early stage so that they may be developed speedily and made available throughout the industry. This feature of the plan induces men with ideas, which they are unable to develop themselves, to submit them for development by the Board's resources.

More News on Following Pages

Preparation Facilities

Pine Creek Coal Co., Spring Glen, Pa.—Contract closed with Wilmot Engineering Co. for one Type A Wilmot jig to prepare pea coal at feed capacity of 15 tph.

Colmac Coal Co., Branchdale, Pa.—Contract closed with Wilmot Engineering Co. for one 12-ft-diameter Wilmot classifier cleaner to prepare No. 5 coal at feed capacity of 65 tph.

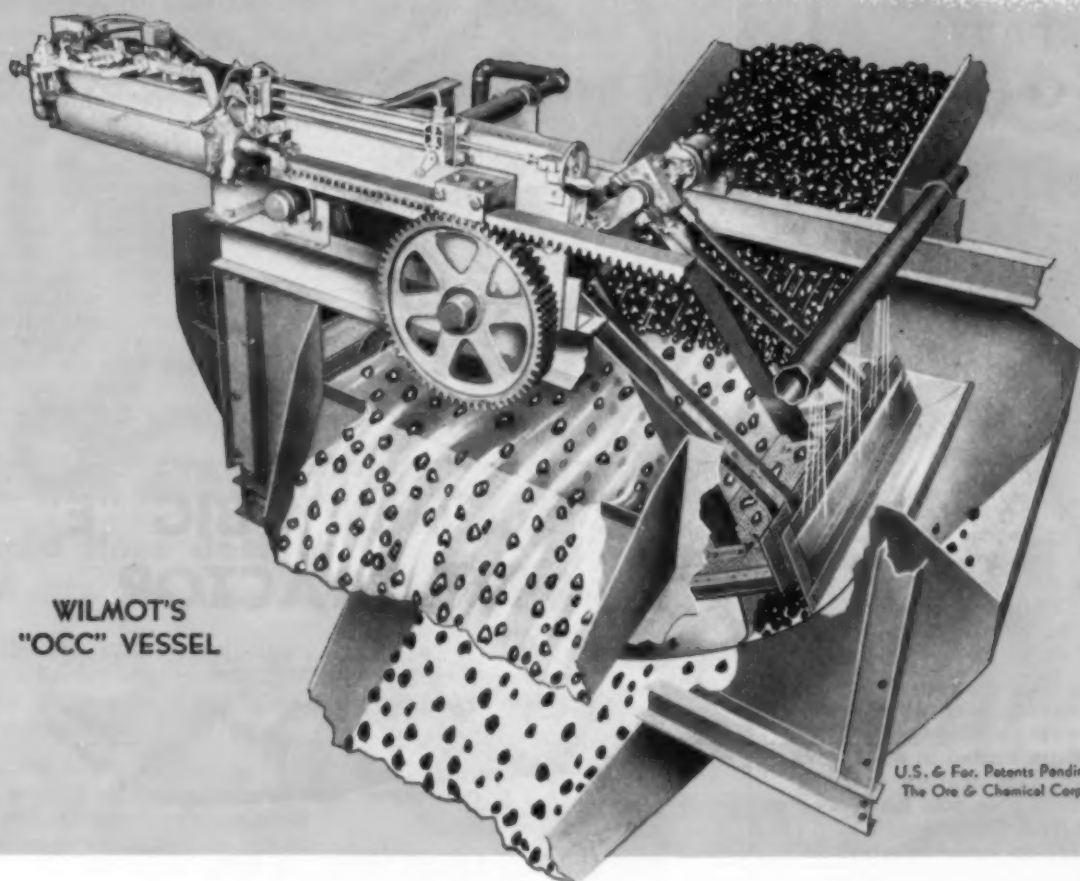
Beaver Brook Coal Co., Beaver Brook, Pa.—Contract closed with Wilmot Engineering Co. for one 5-ft-diameter Wilmot cone cleaner to prepare barley coal at feed capacity of 50 tph.

Saxman Coal & Coke Co., Que-Creek, Pa.—Contract closed with Industrial Engineering & Construction Co. and Fuel Process Co. for cleaning plant, including one 60-in Belknap washer; capacity, 90 tph of 5x% coal.

Pine Township Coal Co., Heilwood, Pa.—Contract closed with Industrial Engineering & Construction Co. for addition to existing plant, cleaning ¾x0 on Model HCRD Deister Concentrator SuperDuty Diagonal-Deck coal-washing table; capacity, 10 tph.

Wilmot Introduces

A Remarkably Simple HMS Separatory Vessel



WILMOT'S
"OCC" VESSEL

U.S. & For. Patents Pending
The Ore & Chemical Corp.

- FEWER MOVING PARTS.
- LOW HORSEPOWER.
- EASY VISIBILITY.

Wilmot's new "OCC" vessel marks a revolutionary development in Heavy Media Separation for the

preparation of anthracite and bituminous coals and the concentration of ores. Here is a vessel so simple that the entire separating process is performed with only the mechanism and power required for lifting the sink from the pool. It is

so flexible, compact and vibrationless that it is easily adaptable as a replacement unit.

We Invite You to send feed samples of your coal or ore for testing in our commercial size pilot plant at White Haven, Pennsylvania.



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Specialists in Economy *for* BRONZE REPLACEMENT PARTS



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Flood City specializes in making bronze bearings and replacement parts from a superior grade of hard, long-wearing bronze . . . machined by experts to a perfect fit!

Standard bronze replacement parts for all types of mining equipment are carried in stock and prompt delivery can be made from both Johnstown and Charleston, W. Va. Good service is also available for special parts and bearings made to your specifications.

Our specialization results in greater economy for you . . . always specify Flood City Bronze Replacement Parts.

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TVA Reports Increased Power Sales; Steam Plants Lead Hydro in Output

"WITHIN the region served by TVA power, the demand for electricity has forged ahead with such rapidity that new generating capacity must be provided soon to meet the future power needs that are developing," the Tennessee Valley Authority said at the end of December in its annual report to the President and the Congress for the fiscal year ending June 30, 1954.

The report disclosed that sales of electric power in the TVA power area increased 26.9% during the year but that use by federal agencies, particularly AEC plants at Oak Ridge, Tenn., and Paducah, Ky., increased 69.4%.

These defense loads, TVA reported, amounted to 11.8 billion kw-hr during the year and will grow to about 30 billion within the next 2 yr. This is approximately equal to TVA's entire sales to all customers during fiscal 1954 and will amount to about half of the total power consumption in the entire valley expected at that time.

"The generating capacity under construction will provide an assured load-carrying ability for the system of 9,443,000 kw by the end of the calendar year 1956," the TVA report said. "This will enable TVA to meet the power demands of that time by only the narrowest of

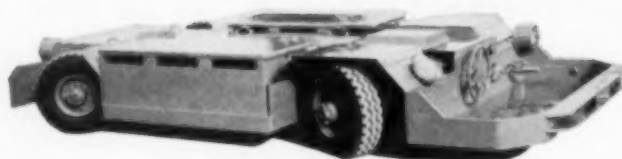
margins and it makes no provision for meeting the additional power requirements forecast for 1957 and 1958. At the end of 1956, the margin for meeting unforeseeable developments, affecting either TVA's generating capacity or now unpredictable demands for new blocks of power, will be dangerously small—in fact, only about half the average margin deemed advisable and being provided by the nation's private utilities," it pointed out.

POWER OPERATIONS

The TVA power system generated about 30 billion kw-hr of electricity during the fiscal year 1954, and for the first time in TVA history steam plants produced more energy than hydro plants, the report said.

"Total generation for the year was 29,929,981,000 kw-hr, an increase of 26% over the 1953 fiscal year. Of the total, 12,815,444,000 kw-hr came from hydro plants and 17,114,537,000 kw-hr from steam plants." In addition to the power generated, TVA purchased 580,913,000 kw-hr and obtained 3,186,114,000 kw-hr in interchange from other systems. Because of the prolonged drought, hydro generation was about 4 billion kw-hr less than that expected

NEW KERSEY BIG "E" 444E TRACTOR



FIRST AND ONLY 4 WHEEL DRIVE — 4 WHEEL STEER TRACTOR

WITH HIGHEST DRAWBAR PULL EVER OFFERED

Trailers — Cars
Exclusive Kersey
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Trip Trailers
ANY SIZE OR
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Weight—8,000 lb.
Length—12 ft.
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Ground clearance—6 inches.
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Lights—2 Sealed beam.
Motors—2 Heavy duty traction type.
Wheelbase—80 inches. Drivegear motor, direct.
Controller—Magnetic contactors.
Brakes—Hydraulic disc, Airplane type with lock.
Battery—84 Volts, 25 Kilowatt hours, in steel trays, which will deliver six years life with reasonable care.

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Thermoid designs and manufactures many types of hose built to give longer service and lower operating costs in a wide variety of specific applications. These 3 are ideal for rugged mining work:

THERMINE Heavy duty air hose, mandrel-built with oil resistant tube reinforced by high tensile yarn. Smooth, abrasion-resistant cover.

THERMOFLEX Mandrel-built air hose for extreme service and direct connection to compressors. Smooth, black, abrasion-resistant cover.

#325 SUCTION HOSE For heavy duty water suction service. Smooth bore, wrapped hose with heavy wire reinforcement, durable cotton duck plies.

Thermoid research is responsible for new, better construction that makes Thermoid hose more durable . . . easier to handle. In addition to hose, your Thermoid Distributor also carries a complete line of Thermoid Conveyor Belting and Multi-V Belts. Call him for complete information. Or if you prefer write direct.

THERMINE

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#325 SUCTION HOSE



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The strongest rack bar makes the toughest jack



Long a favorite with coal miners is the 516 MT. It can raise 5 tons up to 9½ inches, is only 16 inches high when closed, has the famous oblong rack bar for greater strength and dependability.

A ratchet jack like the Duff-Norton all-purpose 516 MT is no stronger than its rack bar, the notched steel "heart" that moves up and down holding the load. The forged steel rack bar on this 5-ton capacity coal mining jack is stronger and tougher than the rack bar on any other ratchet jack of this type. It's *stronger* because it's *larger*!

Next time you see a Duff-Norton jack, examine the rack bar; you'll notice it's oblong like this . Then look at the rack bar on any other make ratchet jack. It's smaller, like this .

So get the most and best for your money with a Duff-Norton Jack.

Ask your distributor for information about Duff-Norton Jacks for coal mines. There's a jack for every lifting, pulling, and pushing job . . . or write the world's oldest and largest manufacturer of lifting jacks for your copy of "A Handy Guide for Selecting Duff-Norton Mine Jacks." Ask for bulletin Ad 10-J, The Duff-Norton Manufacturing Co., P.O. Box 1889, Pittsburgh 30, Pennsylvania.

in a year of average water conditions, the report stated.

NEW STEAM PLANT CAPACITY

"With new steam plant capacity being added rapidly during the year, there was a 74% increase in the amount of power generated by fuel plants, but a corresponding increase of only 66% in the fuel consumed. This was primarily due to the greater efficiency of the steam generating units now being added to the system," according to the report. "TVA steam plants used 7,279,796 tons of coal in the 1954 fiscal year, as compared with 4,392,349 tons the previous year. The average number of Btu used to produce a kilowatt-hour declined to 10,362, as compared with 10,973 in the fiscal year 1953. In the calendar year 1953, the national average was 12,889 Btu per kilowatt-hour generated and in 1952 it was 13,361. Coal cost about \$4.60 per ton on the average (delivered)."

CONSTRUCTION PROGRESS

"The installed generating capacity of the integrated system was increased by 972,700 kw during the year to a total of 6,075,685 kw," TVA reported.

"Of the new generating capacity, TVA added 787,500 kw in six units at three of the six steam plants that were under construction during the year and 158,500 kw in five generating units at four TVA dams. Construction continued on an additional 3,924,800 kw which will bring the installed capacity of the integrated system to 10,000,485 kw in June, 1957. Of the capacity under construction at the close of the year, 3,667,500 kw was being installed in TVA steam plants, 110,500 kw in TVA hydro plants, and the remaining 146,800 kw in the Old Hickory and Cheatham projects of the Army Engineers on the Cumberland and in the Tennessee Creek plant of the Aluminum Company."

Coal Level Dangerous to Nation, Pickett Warns

Tom Pickett, executive vice president, National Coal Association, Jan. 18 urged Secretary of State John Foster Dulles to recommend and support an amendment to H. R. 1, the reciprocal trade legislation before the House Ways and Means Committee, which would provide a quantitative limitation on residual oil imports. Secretary Dulles told the committee in his testimony that quotas on residual oil imports deserve serious consideration.

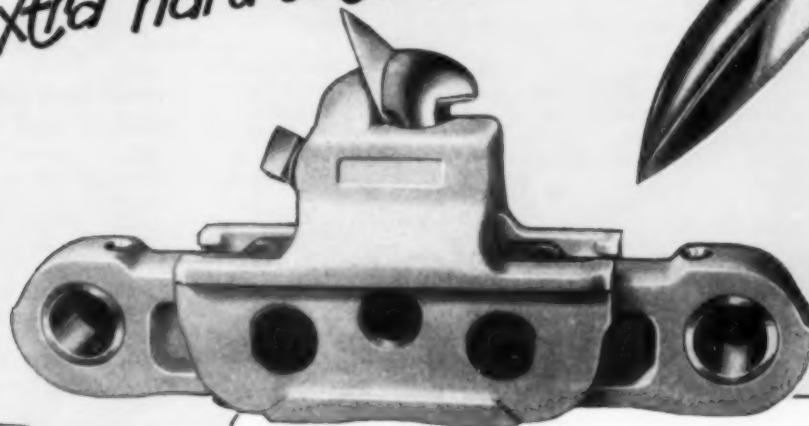
"Meanwhile," Mr. Pickett wrote in a letter to Mr. Dulles, "we think it would be an act of distinguished statesmanship for your department to bring to the importing oil companies and the countries from which flow this unreasonable flood of oil an understanding that America's defense posture now requires a reduction of these imports."

Earlier on Jan. 13, Mr. Pickett wrote all Congressmen, calling their attention to President Eisenhower's statement in his State of the Union message that we must have "sufficient productive capac-

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"Giving Industry A Lift Since 1883"

*Get extra-long-life
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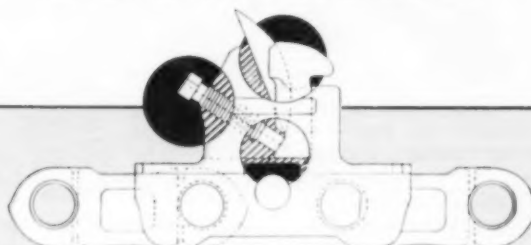
- DUOMATIC CUTTER CHAINS
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COAL CUTTING EQUIPMENT



New Prox Coal Cutting Equipment has already proved itself to be the answer to higher production at lower per-ton costs. The Prox Duomatic Cutter Chain is designed to assure long-lasting dependability. The exclusive, circular-back drop forged tool steel bit is one of the strongest available. And the new Prox Cutter Bars are, by far, America's sturdiest.

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ity" to "protect our nation's vital interests." "Very pertinently," Mr. Pickett wrote, "the production of bituminous coal in 1954 was at least 100 million tons below the 'safe' level as far coal's potential and the national security are concerned."

"Our government's policies concerning the competitive mineral fuels (natural gas and oil, including encouragement of excessive imports of foreign residual oil) have contributed materially to this serious situation. We are seeking a change of these policies. The purpose is to enable the coal industry to attain a normal level that permits a stockpile of productive capacity to meet the challenge of any emergency conditions. . . .

"The policies of the British Government over the years have reduced that nation's coal industry to the point where it failed again in 1954 to meet even the minimum requirements of that country. We must not let that happen to the American bituminous coal industry. We must correct those government policies which threaten to do irreparable damage to our industry's capacity to meet all national demands," Mr. Pickett said.

Later, on Jan. 25, Mr. Pickett wrote the governors of 22 major coal-producing states, asking that they designate special personal representatives to attend the Jan. 31 hearings of the House Ways and Means Committee when the NCA was scheduled to testify on the reciprocal

trade legislation and support an amendment to place quantitative limitations on residual fuel oil imports. "We make this request," he wrote, "so that you may be fully informed as to reasons for appealing on a bi-partisan basis to the members of your state's congressional delegation to support amendments to H. R. 1—before the committee and on the floor of Congress—which will assure the continuing healthy operations of the vital coal industry in your state."

French Limit Oil Sales To Assist Coal Industry

At the government's request, French petroleum refiners, through their trade association, have agreed to limit fuel-oil sales in 1955 to a total of 7.3 million metric tons, an increase of only 100,000 tons over the 1954 total. Sales of fuel oil increased 1.1 million tons in 1954 and 570,000 tons in 1953 over the previous years' totals. The agreement was made with Charbonnages de France, operating company for France's nationalized coal industry. The coal industry has been running at a deficit for several years, and spotty unemployment has begun to appear in the mines. The limitation on fuel-oil marketing follows a recent decree by the government reducing the price of industrial coal by 3% and raising the price of fuel oil by 4%. It is expected to operate as an automatic restriction on changes from coal to oil among French consumers.

Agreement to Increase Italian Imports of U. S. Coal

An agreement between the American and Italian Governments signed Jan. 7 introduces a new system of triangular trade exchanges that is expected to lead to the expansion of Italo-American commerce and larger imports of U. S. coal. Under the plan, the U. S. will supply Italy with the coal it needs and receive payment with goods manufactured in Italy that will be used by the U. S. in

OVER 100 NOLAN PORTA-FEEDERS

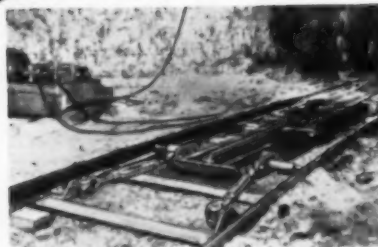
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1. Direct Mechanical Drive
2. Hydraulic Cylinder Type Hose Coupled in Remote Power Unit (Shown in illustration at right)

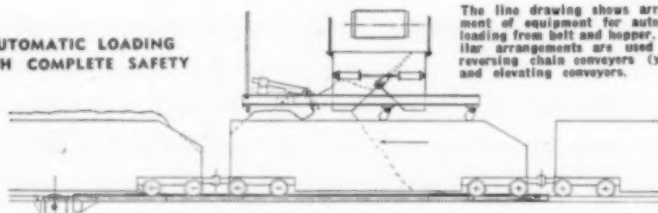


These two Nolan models will help you meet every requirement and condition in spotting cars for loading . . . and can save you many shift hours per day! The Porta-Feeder mounts between the rails on top of the track ties, and is secured by rail clamps. No excavation or preliminary foundation work is nec-



essary. There are no ropes or cables. Reciprocating pushing dogs deliver constant forward feeding motion.

AUTOMATIC LOADING WITH COMPLETE SAFETY



The line drawing shows arrangement of equipment for automatic loading from belt and hopper. Similar arrangements are used with reversing chain conveyors (yoyos) and elevating conveyors.



The Nolan Porta-Feeder has been in successful use in many mines for over five years. This modern method of moving cars has been accepted as the most efficient in the industry. Its ease of installation and quick movability recommends its use in any mine.

We will be glad to show you a mine in your vicinity where the Nolan Porta-Feeder is operating. Write us now.

THE NOLAN COMPANY

106 Pennsylvania St. • Bowerston, Ohio



COAL MEN ON THE JOB . . .

BELL & ZOLLER COAL CO.: Willie Fox (left) and Lonnie Phillips section foremen, Moss Hill and Oriole mines, respectively, Madisonville, Ky.



Here's a Jeffrey shuttle car hauling in a West Virginia coal mine and the payload is just one of the reasons Jeffrey cars are tops. A cable-reel shuttle car with *capacity that pays . . .* and built for rugged service and easy steering under every mining condition — that's Jeffrey!

Another distinctive standard feature of Jeffrey shuttle cars is the two-speed hydraulic drive on the discharge conveyor. It provides *slow* for "jogging" when loading and *slow* or *fast* for unloading . . . plus the advantage of reversing the chain merely by moving the control lever in the opposite direction.

JEFFREY
shuttle cars really
haul it away!

Other standard hydraulic equipment: 4-wheel steering, 4-wheel disc-type brakes, elevating discharge conveyor, cable-reel drive. Also standard: selective two-speed, full-magnetic traction control, sealed-beam headlights, U. S. Bureau of Mines approval plate.

Type	Basic Height	Maximum with Sideboards
MT68	24" or 26"	32"
MT66	30" to 42"	48"
MT67	44" to 54"	60"

Jeffrey shuttle car payloads can be matched to *your* mining height!



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carrying out its foreign aid program in other friendly countries. While reports do not indicate whether there is a ceiling on the transactions contemplated, the agreement particularly specifies that coal purchased on the American market by Italy is not to replace normal imports Italy already obtains from the U. S. and from friendly countries. In effect, the agreement is expected to reduce Italy's purchases from Poland and Russia and other Iron-Curtain countries. Italian imports of Polish coal now are running around 800,000 tons annually.

And For Your Information . . .

Ohio coal holdings of the West Virginia Coal & Coke Corp. are being ac-

quired by the Hanna Coal Co., Div. of Pittsburgh Consolidation Coal Co., James Hyslop, Hanna president, confirmed late in December. The property consists of 1,892,000 acres in Lawrence and Gallia counties and is estimated to contain around 1,500,000 tons of coal. Hanna is adding the property to its reserves and had no present plans to mine the coal, Mr. Hyslop said.

The ruling by trustees of the UMWA Pension Fund that a retired miner must work 20 yr in the industry to be eligible for a pension is being contested by a retired miner who worked 17 yr in anthracite mines and some 8 yr in bituminous. Wasil Geron, through counsel, Jan. 6 appealed to the Pennsylvania

Supreme Court to reverse a Lackawanna County Court decision upholding the trustees, maintaining that the contract setting up the fund said payments were to be made to UMWA members and that the trustees did not have the power to set such regulations as the 20-yr minimum.

Five major power companies operating in Minnesota are planning to add a total of 100,000 kw of steam-generating capacity a year for the next 5 yr to their present combined capacity of 1,250,000 kw. The plans involve investment of \$358,750,000. The companies are the Interstate Power Co., Minnesota Power & Light Co., Mississippi Valley Power Co., Northern States Power Co. and Otter Tail Power Co.

The new Sunnyhill Coal Sales Co. formed Jan. 1, is the result of the merger of three well-known sales companies, the Brown-Ward Co. founded in 1919, Snyder & Swanson, Inc., formed in 1927, and the New York Coal Sales Co., established in 1902. The new firm will provide wider coverage and economy of operation to the mines represented by the three companies and will offer customers a more diversified line of coals and better service, it points out. Main office will be in Columbus, Ohio, and officers are: H. Gerrit Ward, chairman of the board; David H. Swanson, president; Arnold E. Lamm, vice president; and Cliff H. Snyder, secretary-treasurer.

Latest coal producer to enter uranium mining is the Rochester & Pittsburgh

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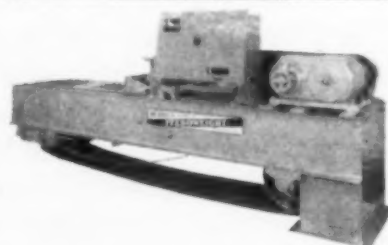
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Fiatt, Illinois Mine uses
STANOIL
Industrial Oil in stripper
hydraulic jacks for 18 years

At Truax-Traer Coal Company's Fiatt, Illinois, mine, the production goal is 1,000 tons of coal an hour. That's a stiff assignment. It leaves no margin for failure. This indeed applies to the hydraulic jacks of the company's Bucyrus-Erie 950-B stripper. It's the reason STANOIL Industrial Oil has been used as the hydraulic fluid in the four hydraulic jacks since the stripper went into operation in 1937. Eighteen years continuous service

is testimony to STANOIL's ability to deliver under any operating condition—heat, cold, rain, dust, dirt.

But there's more to the story than just the ability of STANOIL Industrial Oil to deliver under a wide range of operating conditions. The rest of the story is the Standard technical service provided by men with training and experience.

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Since start of operations in 1937, STANOIL Industrial Oil has been used as hydraulic fluid in Bucyrus-Erie stripper at Truax-Traer Coal Company mine, Fiatt, Illinois. This 950-B stripper is hub of one of the biggest strip mining operations in Fulton County, state's second largest coal producing county.

Bob Wright, Standard Oil lubrication specialist is on the spot to provide technical service on lubrication problems. Bob has a B.S. in engineering from Michigan College of Mining. Before entering field sales work, Bob completed Standard's Sales Engineering School course in industrial lubrication. Customers find this experience and background pay off for them.



STANDARD OIL COMPANY
(Indiana)



Coal Co., Indiana, Pa. Dr. Charles J. Potter, company president, announced that R&P and the Vitro Corp. of America will form a new corporation, with R&P to mine the uranium-bearing ore and Vitro to do the processing. The two companies have been looking for uranium ore for some time and have acquired claims in Utah and Wyoming, together with exploration rights in Ontario, Canada.

Sale of some 15,000 acres of Kentucky coal lands containing approximately 32 million tons of coal for a cash payment of \$1,300,000 was reported Jan. 24 by the Elk Horn Coal Corp., Charleston, W. Va. Over 29 million tons of coal has previously been mined from the prop-

erty. In making the announcement, W. W. Goldsmith, president, reported that while the company had had an operating loss in 1954 it expected improvement during the coming year.

The H. E. Harman Coal Corp., operating in Buchanan County, Virginia, has been purchased by the newly organized Harman Mining Corp., according to an announcement by W. W. Walker, Bluefield, W. Va., who is chairman of the board of the new firm. I. J. Richardson, president of the former Harman company, is president of Harman Mining and operations, will continue without change. Sovereign Pocahontas Co., Bluefield, will continue as exclusive sales agent for the company.

Anthracite coal makes up 65% of a new-type compound for battery cases developed after 3 yr of research by the Bowers Battery & Spark Plug Co., Reading, Pa. The anthracite is blended with synthetic rubber to form a more durable compound that "will withstand higher temperatures for a longer period of time," the company reports. Full-time production of the new battery cases and covers began in December. The company is continuing its research to find other new uses for anthracite.

The Carbon Fuel Co., Charleston, W. Va., Jan. 1 took over operation of the Winifrede (W. Va.) No. 2 mine of Winifrede Collieries following stockholders' approval of the merger of the two companies at a meeting held Dec. 29. Mining interests owned by Winifrede in Mingo and Fayette counties, West Virginia, and Buchanan County, Virginia, were not involved. Operating personnel of the Winifrede mine will continue without change. L. N. Thomas, Carbon Fuel president, reported.

Output of West German soft coal hit a new post-war peak in 1954, it was reported Jan. 5. Production of 87,828,000 tons was 3,274,000 tons over 1953, the Soft Coal Mining Association announced. New post-war records in production of hard coal and steel also have been reported.

The oil and gas industries last month launched a "king-size publicity campaign" to obtain support of some 21

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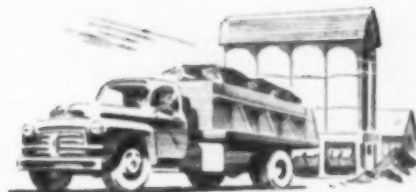


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million natural-gas users for legislation coming up in Congress to free gas producers from federal control. The campaign will include newspaper, TV and radio advertising, as well as publicity, and may cost as much as \$1½ million. Support of the coal industry, among other competitors, is being solicited on the theory that if gas is controlled at the producing level the same thing may later happen to coal.

Miner-shareholders of the co-operatively owned Livingston Mt. Olive Coal Co., Livingston, Ill., Dec. 23 pledged themselves to raise \$125,000 to build a modern tippie to replace the one destroyed by fire the previous day. Of undetermined origin, the fire swept the tippie during the early-morning hours and completely destroyed the wooden structure.

The Soviet coal industry achieved 101% of the government's goal in 1954, according to reports released in Moscow Jan. 20. Earlier reports "indicated" that 1954 coal production was about 380,000,000 short tons, a record figure.


The Barnes Coal & Mining Co., Coshocton, Ohio, has been acquired by the Sinclair Coal Co., Kansas City Mo., which also operates the Broken Aro Coal Co., Wellston, Ohio. Some 3,000 acres of coal land was included in the sale.

To help meet the need for trained salesmen, a new course in "Creative Salesmanship" for those actually engaged in selling or just beginning sales careers has been developed by the International Correspondence Schools, Scranton, Pa. The seven texts in the course are written by Waldo Carlton Wright, nationally known sales consultant, who formerly was on the faculty of the University of Scranton. The course is available under a plan permitting employers to select only those subjects required to achieve specific training objectives.

North Dakota lignite interests won out over natural gas Dec. 30 when the Public Service Commission of North Dakota dismissed the second application of the North Dakota Natural Gas Transmission Co. to build and operate a pipeline system to serve the principal cities in the state. The firm proposed to sell large quantities of interruptible gas to large industrial and utility installations as boiler fuel, displacing substantial tonnages of lignite. The PSC held the project "not economically feasible" since the company "does not have markets for the natural gas it proposes to purchase."

The calendar year is seldom the best choice for a company's fiscal year, according to a new pamphlet offered without charge by the American Institute of Accountants, 271 Madison Ave., New York 16. Entitled "Do You Close Your Books on New Year's Eve," the booklet outlines the many advantages of a fiscal year based on an organization's natural business year, which it explains as covering an annual cycle of activity ending when inventories, receivables and bank loans are lowest.

Japanese steel mills are planning to switch part of their coking coal imports




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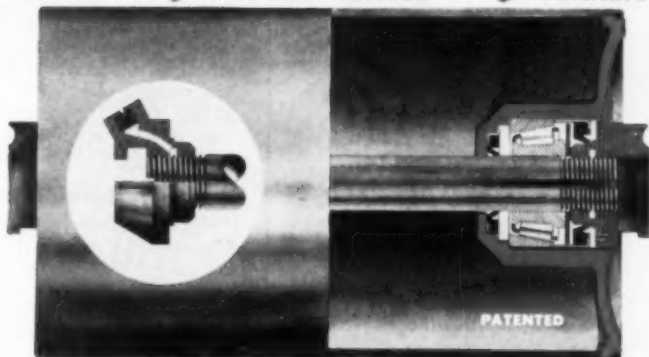
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Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klosures, are the answer to the operator's prayer.

The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellent grease of a stable consistency with a wide temperature range for long life.

Most important—this construction permits operating the Continental "UST" Idler for extended periods of time without relubrication for 1-2-3 years or longer depending upon the severity or character of conditions.

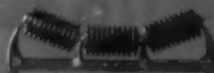
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from the United States to Communist China because of the rise in prices of American coal, according to reports from Tokyo. A spokesman of the Yawata Iron & Steel Co., Japan's largest steel producer, said the company would like to import approximately 100,000 tons of coking coal mined in the Hailan mine, North China, this year. A local press report stated that three leading mills, including Yawata, were negotiating for imports of 200,000 to 300,000 tons of Chinese coking coal. Last year only 20,000 tons was imported.

The Utah Power & Light Co. during the latter part of 1954 placed in operation a 66,000-kw mine-mouth power plant at Castle Gate, Utah, and is expected to have another plant completed by mid-1955—a 100,000-kw unit located at Gadsby, near Salt Lake City. The Castle Gate site of the \$11,800,000 plant was chosen in the interest of economy for both the company and the consumer, with the plant receiving its coal directly from an adjacent mine.

Non-union anthracite operations produced 1,679,000 tons during the first 10 mo of 1954, a drop of only 2.6% as compared with the 17.6% decrease in union output, the Anthracite Committee reports. During the period, 1954 non-union production was 8.8% of union tonnage, compared with 7.5% in 1953. The number of holes increased from 704 to 962 in 1954, or 36.6%, and the number of men employed from 2,785 to 3,517, or 26.3%.

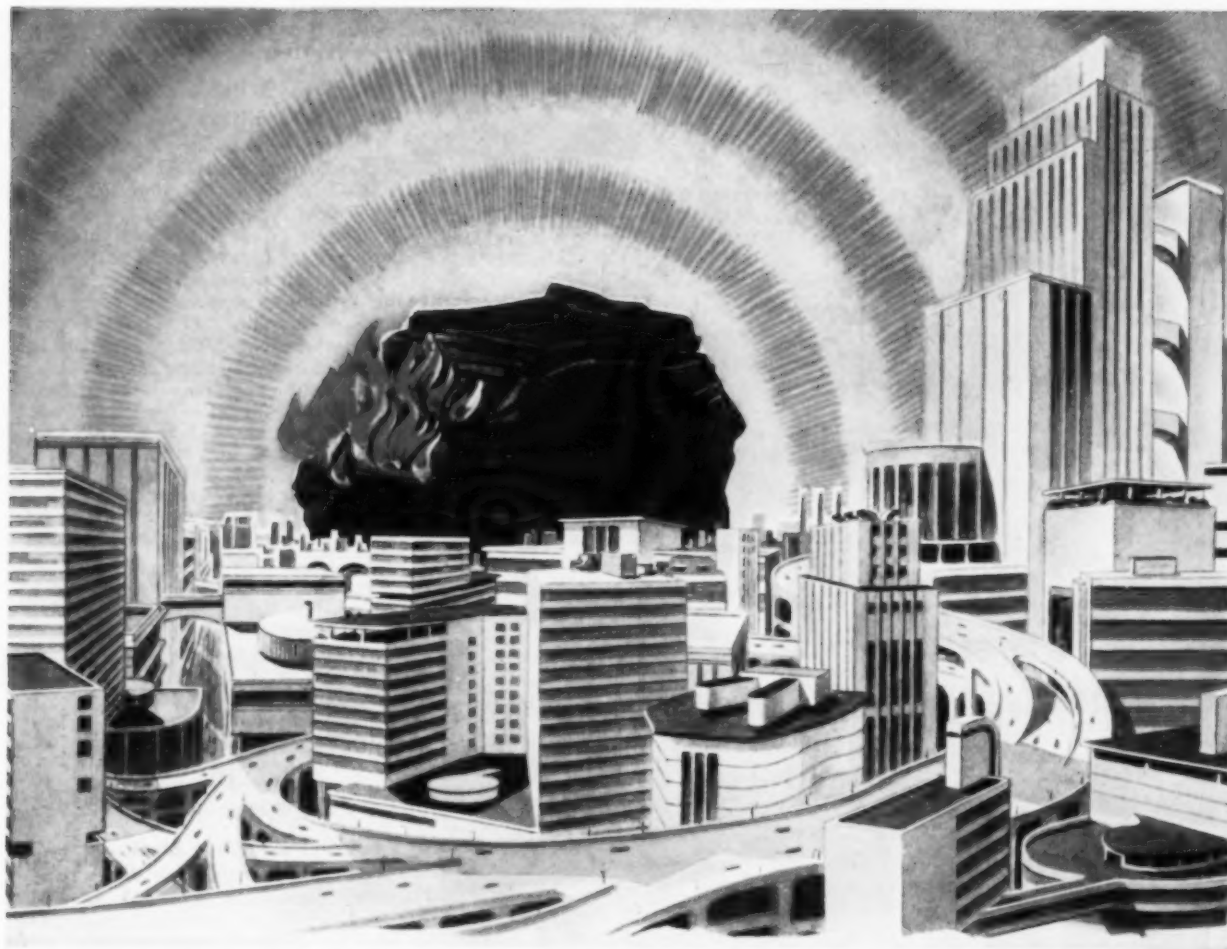
Company Earning Reports

Ayrshire Collieries Corp. and subsidiaries—6 mo ending Dec. 31, 1954, net income of \$725,095, or \$1.27 per share, compared to a net of \$638,425, or \$1.12 a share, in the same period of 1953. For the 1954 quarter ending Dec. 31, net income was \$548,964, or 96c a share, against a net of \$556,952, or 98c a share, in the 1953 quarter.

Hudson Coal Co. and subsidiaries—Year to Dec. 31, 1954, net loss of \$2,-874,935, compared to a loss of \$2,949,-527 in 1953. For the fourth quarter only, the 1954 loss was \$165,267, against a loss of \$728,802 in 1953.

Island Creek Coal Co.—Estimated 1954 net profit of \$1,660,000, or \$1.27 per share of common stock, compared to a 1953 net of \$1,511,563, or \$1.14 a share. In the fourth quarter of 1954 the pattern of declining production was reversed, the company reports, and the output of 1,635,119 tons exceeded that of the last quarter of 1953 by 279,531 tons. During the period, sales gains were accomplished in all markets and production costs continued to decrease, with the result that earnings in the last quarter were greater than those in the first 9 mo and the net profit for the year exceeded that of 1953.

Pond Creek Pocahontas Co.—Estimated 1954 net profit of \$1,095,000, or \$3.23 per share of capital stock, compared with the 1953 net of \$1,483,473, or \$4.37 a share.



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Dust Control, Worker Health

Industrial Dust, by Philip Drinker and Theodore Hatch. This new edition, with the extensive developments of recent years includes engineering, laboratory and medical aspects of dust control in relation to the health of workmen. Material covers the physical substances composing dust and fume suspensions and their effect on man; the analysis, measurement and microscopy of fine dusts; the practical control of dusts; and the use of respiratory protective devices. 401 pp. \$10.00. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N.Y.

Engineer's Pocket Book

The Practical Engineer Pocket Book, 1954, edited by N. P. W. Moore. The new edition of this well-known book contains up-to-date data in many mechanical fields such as hydraulics, lubrication, metal-working, steam power, internal-combustion engines, gas turbines and so on. The book also contains technical dictionaries in German, Spanish, and French, and a feature of the new edition is a chapter on industrial hygiene. Pitman Publishing Corp., 2 West 45th St., New York 19. 744 pp. 3½ x 5¾-in; cloth. \$3.

Mineral-Based Civilization

Minerals in World Industry, by Walter H. Voskuil, chief mineral economist, Illinois State Geological Survey, and professor of mineral economics, University of Illinois, is a comprehensive evaluation of the role of minerals in establishing and maintaining a high standard of living and their importance in the development of the distinctive American culture. The author discusses the central importance of iron and how other minerals affect our mineral-based society. All types of fuels, including coal, liquid and gaseous fuels and fissionable materials are rated with respect to their actual or possible impact on world industry, and the author also turns his attention to the impact of mineral resources on international politics. 324 pp. \$5.75, cloth. McGraw-Hill Book Co., New York 36, N. Y.

Conowingo Tunnel Proposal

Flood Prevention in Anthracite Mines, Northern Field, by S. H. Ash; H. A. Dierks; H. D. Kynor; W. H. Lesser; P. S.

GM DIESEL
CASE HISTORY NO. 537-42

USER: C. H. Snyder
Coal Company,
Cowansville, Pa.

INSTALLATION: GM "6-71"
2-cycle Diesel replaced
4-cycle Diesel in shovel
over 2 years ago.

PERFORMANCE: Owner
C. H. Snyder reports
better performance,
25% more production
with GM Diesel power.
GM Diesel starts faster,
uses less lube oil, gives
smoother operation.



It Pays to Standardize on

... available in more than 750 models of equipment built by over 150 manufacturers.



Production up 25% with **GM DIESEL POWER**

When his shovel was two years old, owner C. H. Snyder switched to General Motors Diesel power and upped production from 8,000 to 10,000 tons of coal per month. He converted to GM Diesel because these 2-cycle Diesel engines have given him dependable low-cost performance in a tractor, dragline, truck and another shovel.

Fast-accelerating, smooth-running GM Diesels do more work at less cost in new equipment or old. They start at the push of

a button even in coldest weather—deliver power at every piston downstroke to speed operations, boost production. Low-cost parts are readily available and GM Diesel distributors back up GM Diesel performance with on-the-spot service. Call your distributor today—ask him about low-cost horsepower for *your* job.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 30 to 300 H.P. Multiple Units . . . Up to 864 H.P.

NEFF & FRY

SILOS

FOR COAL MINE USE



Many Neff & Fry Silos are used at coal mines for stand-by or surge-bin purposes. Coal from mine mouths is conveyed to silos for withdrawal to railroad cars, trucks, or processing plants. If the flow of coal is halted for any reason, it can accumulate in the silos, thus averting a stoppage of operations.

Neff & Fry Silos are admirably adapted for the purpose because of their stamina and longevity. The Super-Concrete Staves have rock-like strength and endurance. They survive the battering incidental to coal movement.

A Neff & Fry Silo can be dismantled and erected in another location, which frequently is a contingency in coal mine usage.

These are a few facts which should arouse your curiosity for further information. We'll be glad to send you literature and data—without obligation, of course.

THE NEFF & FRY CO.
228 ELM ST. • CAMDEN, OHIO

NEFF & FRY

SUPER-CONCRETE STAVE
STORAGE BINS

Miller, and W. M. Romischer, U. S. Bureau of Mines. Study recommends the creation of a tunnel authority by the Commonwealth of Pennsylvania to administer the operation of a 137-mi drainage tunnel from the anthracite region to Conowingo, Md. The study further recommends that the Federal government appropriate \$18,723,846 for construction of the first portion of the tunnel. This initial section, designated in the report as Project No. 1 (Lackawanna), consists of 11.89 mi of tunnel extending from Pittston to Throop, Pa., to serve the northern anthracite areas where the drainage problem is most burdensome. The bulletin also includes a description of the entire tunnel proposal, geology and hydrology of the Lackawanna area, the economic development of the region. *Bulletin 545.61 pp; 8x10½ in; paper. Price \$1.00. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.*

TVA Report

Annual Report of the Tennessee Valley Authority. Here's a detailed description of the activities of TVA for the fiscal year ending June 30, 1954. Major sections include dividends to the nation; construction progress; multiple-purpose water control; growth of power operations; fertilizers and munitions; use of fertilizers; cooperative forest development; and small water sheds. Appendixes contain financial statements, statistical tables, and contracts and agreements. *188 pp. 5x9½ in; paper. 70¢.*

Superintendent of Documents, Government Printing Office, Washington 25, D.C.

Unusual Mine Fatalities

It Couldn't Happen, by D. S. Kingery. This booklet describes five unusual fatal mine accidents and emphasizes that everyone working underground is exposed to inherent mining hazards and that safety devices, though provided, often are ineffective or not used. *USBM, I. C. 7694. 12 pp. 8x10½ in; paper. Free. Supt. of Documents, Government Printing Office, Washington 25, D.C.*

Other Books and Booklets

Estimate of Known Recoverable Reserves of Coking Coal in Perry County, Ky., by J. J. Wallace, J. J. Dowd, R. G. Travis, R. F. Abernethy and D. A. Reynolds. *USBM, R. I. 5083. 26 pp. 8x10½ in. Free. Supt. of Documents, Government Printing Office, Washington 25, D.C.*

The following publications by the U.S. Bureau of Mines are available from the Bureau of Mines, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

Recommended Standards for Installation and Maintenance of Haulage Roads, by D. S. Kingery and T. F. Curry. *I. C. 7701*

Technology of Lignitic Coals, Part I. *I. C. 7691*

Technology of Lignitic Coals, Part II. *I. C. 7692*

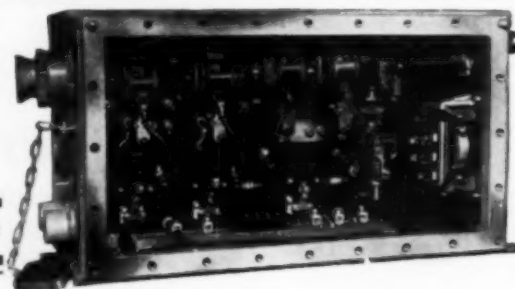
ENSIGN-CLARK

HEAVY DUTY

MINE

SERVICE

STARTERS



expertly designed

ruggedly built

A few of the many special features that can be built into an Ensign-Clark starter are illustrated in Bulletin 5392 Starter, above. This 20-30 HP, 250-Volt DC unit has Bureau of Mines Explosion Tested Enclosure, three-point acceleration, is reversing with switch interlocked to prevent plugging. All parts are readily accessible. Ideal for belt conveyor operation, and can be designed to meet your special requirements.

ENSIGN

ELECTRIC & MANUFACTURING CO.
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in your area is ready
to serve you . . . today!

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BOSTON MAN'S
BUSINESS:
rubber products
engineered to
your job**

**Fast-Moving Boston Research
Gives You Better
Industrial Rubber Products!**

THE BOSTON MAN has solved problems in many instances almost identical with one that may be costing you money in your mining operation.

For all the industrial rubber goods your company uses—from V-belts to mighty underground conveyor belts, friction tape to water hose, it will pay you to do business with Boston's specialists. Behind every Boston product stands a background of research unsurpassed in the industry. And if your needs are out of the ordinary, Boston's staff of scientists, engineers and designers stand ready to meet your most exacting requirements.

Why not bring your problems to one of the world's largest specialists in the manufacture of mechanical rubber goods. See our distributor in your area. He is your "Boston Man."

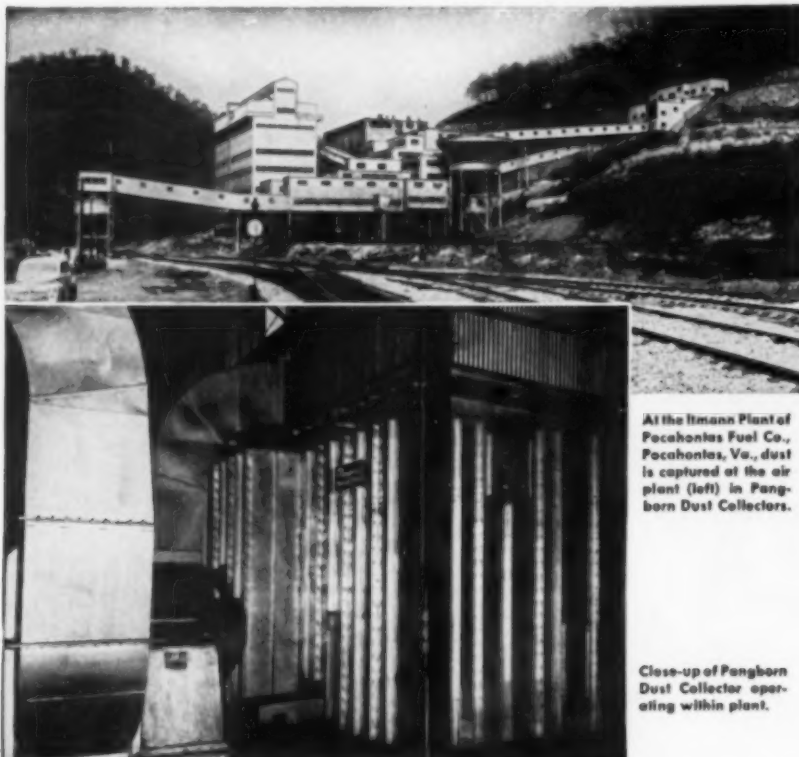
BOSTON

BOSTON WOVEN HOSE & RUBBER CO., Box 1071, Boston 3, Mass.

Industrial Hose • Fire Hose • Belting • V-Belts • Packing • Tubing • Garden Hose • Tape • Matting and Stair Treads

COAL AGE • February, 1955

157



At the Itmann Plant of Pocahontas Fuel Co., Pocahontas, Va., dust is captured at the air plant (left) in Pangborn Dust Collectors.

Close-up of Pangborn Dust Collector operating within plant.

For more profitable coal preparation *Look to* **PANGBORN DUST CONTROL**

More mechanization and more production have helped the coal industry meet industry's vastly increased demands over the past decade. But they have created a serious problem for coal processing plants. If you face this problem—it will pay you to look to Pangborn Dust Control for the answer!

Pangborn Dust Control traps dust at the source—at tipples, dry

cleaning, de-dusting and other operations. And Pangborn Dust Control saves you money, pays for itself by . . . (1) improving the reclamation of valuable dust . . . (2) lowering plant maintenance costs . . . (3) increasing the life of your machines because they operate in a cleaner atmosphere. What's more, higher morale and better health of employees mean increased production.

If you're losing profits because of excessive dust, let Pangborn engineers conduct a free Dust Pocket Survey. It costs you nothing but can mean big savings. Write today for details and your free copy of Bulletin 909A. Just address: PANGBORN CORPORATION, 2800 Pangborn Blvd., Hagerstown, Maryland.

Pangborn

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment

DUST CONTROL

STOPS THE DUST HOG from stealing profits

MANUFACTURERS . . . From p 132

Ryerson since 1936, starting at Chicago. He was named assistant general manager of sales for all Ryerson plants in 1954. Mr. Houston also started with Ryerson at its Chicago plant in 1934. In 1949 he was assigned special administrative duties at Chicago, and in 1950 was appointed assistant sales manager of the Chicago plant.

Worthington Promotes Meiter

William A. Meiter, central sales manager, Worthington Corp., Harrison, N. J., has been promoted to general sales manager, succeeding Thomas J. Kehane who has been appointed vice president in charge of sales. Mr. Meiter joined the Worthington training class in 1927 and served as a sales engineer in the Cleveland district sales office. In 1938 he was named manager of the Buffalo district sales office and, in 1950, became central sales manager. Clarence S. Wentworth, manager of Worthington Corp.'s Detroit district office since 1950, has been appointed Central Region sales manager, succeeding Mr. Meiter. Mr. Wentworth started with Worthington in 1922 as a service engineer in the Los Angeles district office and had held various sales posts before moving to Detroit.

Marion-Osgood Revises Sales

Marion Power Shovel Co., Marion, Ohio, has established a consolidated sales department for the entire line of Marion-Osgood-General equipment in both the domestic and export markets to provide greater convenience to customers. D. E. Rizor has been named to head the co-ordinated program as vice president for sales and service. With Marion for the past 29 yr, he previously was vice president in charge of service, parts and pricing. Kenneth O. Williamson has been appointed Marion-Osgood-General sales manager, responsible for the sale of machines 4 cu yd and under through distributor organizations throughout the United States and Canada. Mr. Williamson has been associated with The Osgood Co., new subsidiary of Marion Power Shovel, since 1941, and served successively as division sales manager, assistant sales manager and sales manager. Richard M. Bessom is export sales manager in charge of sales of the complete line of machines abroad.

Dixon Promotes Three

The promotions of H. E. Ehlers Jr. to the post of general sales manager, R. C. Brock to industrial sales manager, and D. C. McMillin to district manager, Pacific Coast district, have been announced by the Joseph Dixon Crucible Co., Jersey City, N. J. Mr. Ehlers joined the organization in 1935 as a member of the Crucible & Refractories Div., was appointed manager of the division in 1948, and in 1952 was named industrial sales manager. Mr. Brock joined Dixon as an industrial sales representative in 1948 and has been Pacific Coast district manager since 1951. Mr. McMillin has been with the Dixon Pencil Products Div. as a sales representative since 1952.



wise old owl says...

savings on track cleaning costs have paid for the "Canton" Track Cleaner in a few months (names on request). For every 100 tons of combustible matter you clean up, you also save buying and applying up to 200 tons of rock dust.

Mine inspectors like a clean haulage road. The "Canton" Track Cleaner removes two hazards . . . unsure footing, and accumulation of explosive coal dust . . . and makes you money too.

WRITE TODAY FOR FULL DESCRIPTIVE FOLDER ON THE "CANTON" TRACK CLEANER.



The American Mine Door Company

2061 Dueber Ave., Canton, Zone 6, Ohio
Other Self-liquidating Equipment . . . Rock Dusters . . .
Electric Switch Throws . . . Car Transfers . . . Automatic
Doors . . . Cable Splicers.



hydradjuster

ADJUST YOUR TRACKS WITH A GREASE GUN

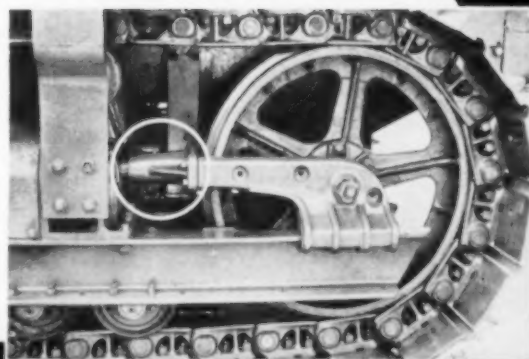
HYDRAULIC TRACK ADJUSTER

HYDRADJUSTERS make it possible for a single operator to adjust the tracks on any size crawler tractor in two or three minutes. The only tool needed is a hand grease gun filled with ordinary grease.

Contractors who have HYDRADJUSTERS report an increase of 20 to 40% in the life of costly track parts as a result of consistent, proper, track adjustment.

ALL HYDRADJUSTERS are guaranteed and are specially designed for A-C, CAT and IHC tractors. The HYDRADJUSTER can be installed in approximately the same time ordinarily required to adjust the tracks by old method.

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Here's How...

Dump a big dipper full of coal or overburden into a Heil Rock Body. Drop the heaviest load your bucket can hold into it. Give it the roughest shock treatment of a rough industry.

Production rolls merrily along!

As long as the trucks under them move, Heil Shock-Proof Rock Bodies are in your production line, because they're built to stay on the job and out of the shop.

The 2" hardwood cushion sandwiched between body bottom and wearing plate absorbs load shock. Bodies fabricated of 1/4" (or heavier) steel plate, rigidly reinforced by box member ribs, assure "no sag" strength and stamina. For cold weather work or handling sticky gumbo, heated floor construction can be supplied.

HEIL HEAVY-DUTY HOISTS

Hoist performance is just as important to keeping up production as shock-proof bodies. Heil Hoists are matched to Heil bodies for always dependable, always economical durability.

Call your Heil distributor for proof of Heil Body and Hoist production in the field.

Always Specify

THE HEIL CO.

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Factories: Milwaukee, Wis. — Hillside, N. J.

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BH-52-C



COAL MEN ON THE JOB...

HALE COAL CO Rita, Logan County, W. Va.; Noah G. Hale (left), company president, with H. M. White, West Virginia district mine inspector.

Eaton Axle Div. Appoints

Eaton Mfg. Co., Cleveland, Ohio, has named R. C. Ochs assistant general manager of the Axle Div. With Eaton since 1948, Mr. Ochs has a background of sales, research and purchasing experience, and since 1952 has been assistant to the general manager of the Axle Div. The company also announced the acquisition of plant and office space of the Bryant Heater Div. of Affiliated Gas Equipment, Inc., Cleveland. Eaton's Stamping Div. personnel and facilities will be moved to the Bryant Heater plant, while Eaton's Axle Div. will utilize the floor area of the present stamping plant. Most of the space will be occupied by the Replacement Parts Dept.

LeTourneau-Westinghouse To Buy J. D. Adams Co.

Merle R. Yontz, president of LeTourneau-Westinghouse Co., Peoria, Ill., has announced that LeTourneau-Westinghouse has entered into an agreement to purchase the plant and assets of J. D. Adams Mfg. Co., Indianapolis, Ind., a pioneer manufacturer of roadbuilding and earthmoving equipment since 1885, subject to approval of Adams' stockholders. The purchase includes inventories, receivables and approximately 500,000 sq ft of completely equipped plant and manufacturing facilities in Indianapolis and Canada, which increases the number of plants operated by LeTourneau-Westinghouse to six. Total consideration was not disclosed. According to Mr. Yontz, Adams products will continue to be produced in Indianapolis and Canada, with the plants there to be known as the Adams Div. of LeTourneau-Westinghouse Co. There will be no immediate changes in the distribution, production and managerial policies of the Adams division. Howard R. Meeker, currently president of Adams, will be chairman of the board of LeTourneau-Westinghouse and Mr. Yontz continues as president. Floyd

Lower Pumping Costs

IN HEAVY MEDIA SERVICE

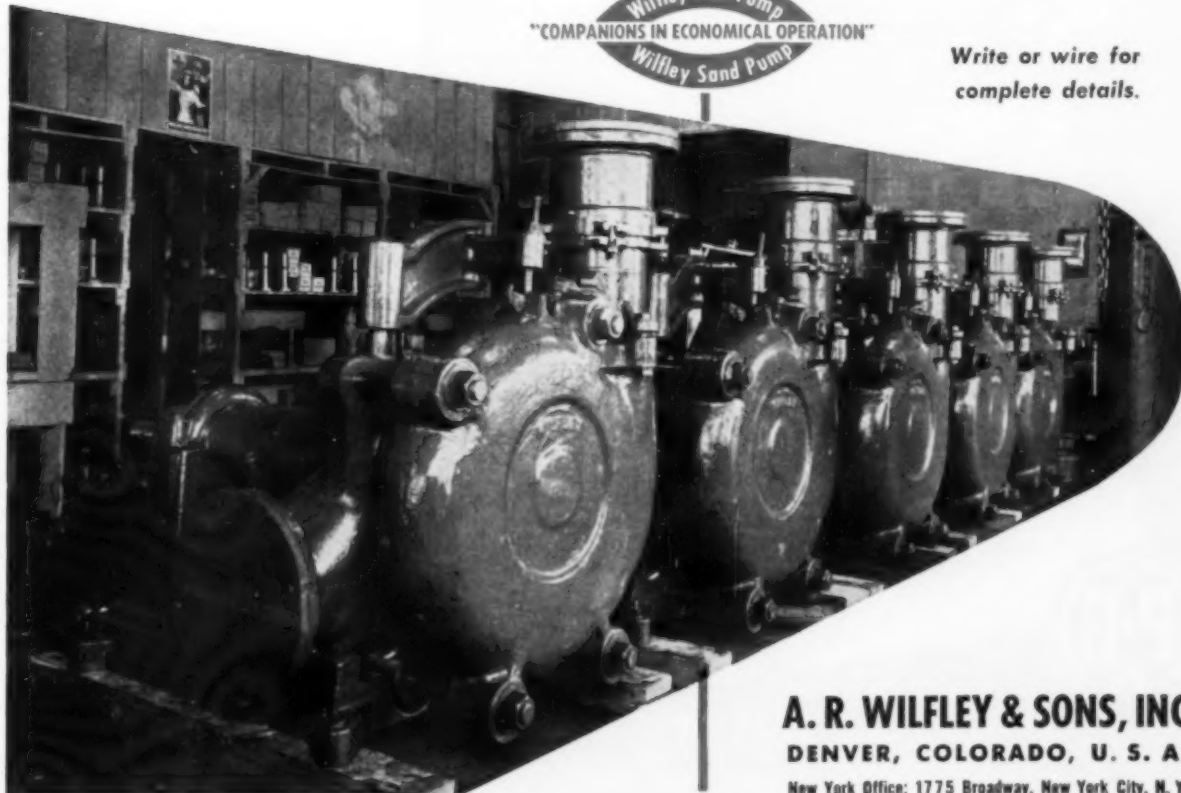
These Wilfley 8 inch Model "K" Sand Pumps are specifically designed for rugged, heavy duty service in a new coal preparation plant. These dependable, highly efficient pumps deliver continuous, trouble-free performance at low cost without media loss, leakage or dilution.

WILFLEY PUMPS

- Individual engineering on every application
- Cost-saving efficiency
- Reduced power and maintenance costs
- Continuous operation without attention
- Minimum replacement of parts
- Designed for simple installation
- Economical pump size for every requirement

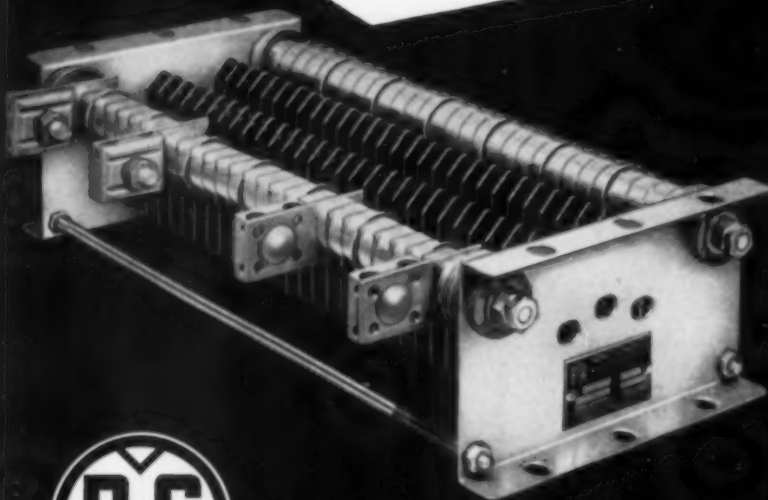
Wilfley Acid Pump
"COMPANIONS IN ECONOMICAL OPERATION"
Wilfley Sand Pump

Write or wire for
complete details.



A. R. WILFLEY & SONS, INC.
DENVER, COLORADO, U. S. A.
New York Office: 1775 Broadway, New York City, N. Y.

There is a
difference
in Resistors



Resistors have proved
this for many years

Different, because steel and mica, both extremely durable materials, coupled with P-G exclusive design produce a resistor of great mechanical strength. There is nothing to break. With accurate resistance values and adequate carrying capacities, P-G Resistors outlast ordinary resistors. Tell us your specifications and let P-G solve your resistor problem.

For any job . . . Where constant "trouble free" resistor service is wanted . . . you can safely specify P-G Steel Grid Resistors and get better performance with low cost maintenance.

The Nonbreakable Steel Grid Resistor



THE POST-GLOVER ELECTRIC COMPANY

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COAL MEN ON THE JOB . . .

MINE NO. 17, PEABODY COAL CO., PANA, ILL.—Henry Tate (left), chief electrician; Tony Shimkus, mine superintendent; and Bill Hatfield, mine manager.

D. Wallace, vice president of Adams, will become a vice president and director of LeTourneau-Westinghouse and will be general manager in charge of manufacturing operations in Indianapolis.

Link-Belt Names Sales Head

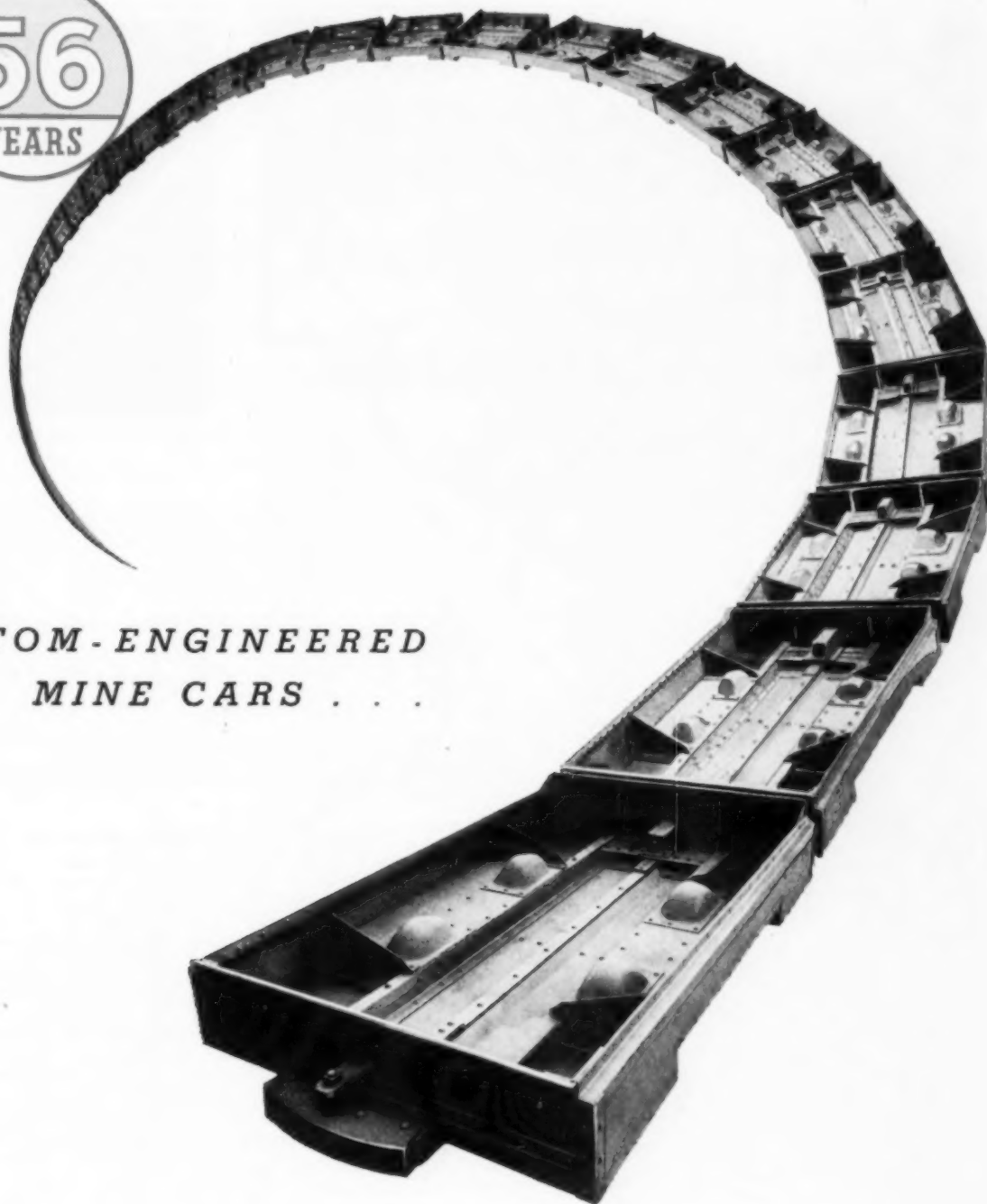
Link-Belt Co., Chicago, has named Chester E. Ault assistant sales manager for the company's Pershing Road plant in Chicago, succeeding Andrew K. Kolar, made purchasing agent for the same plant. Mr. Ault has been with Link-Belt since 1924 and his sales posts have included two of the company's district offices and four of the plants. For the past 4 yr he has been manager of belt-conveyor idler sales, with headquarters at the company's Ewart plant in Indianapolis.

Cummins Names Regional Mgrs.

Cummins Engine Co., Inc., Columbus, Ind., has appointed M. W. Brooks regional manager, Mid-West district—central region, with headquarters in St. Louis, Mo. Mr. Brooks will serve as Cummins representative in the Kentucky, southern Illinois, Missouri, Iowa, northern Kansas, Nebraska and South Dakota areas. Until recently he headed the Industrial Power Div. of White Motor Co., and before that he was Cummins regional manager at Cleveland. H. A. Strohman, assistant regional manager, Eastern region, has been transferred from his previous New York headquarters to the new Cummins Middle-Atlantic office in the Hall Bldg., Harrisburg, Pa. Mr. Strohman will act as Cummins representative in Pennsylvania, Maryland, Delaware, southern New Jersey, the western third of New York State, and a portion of northern Virginia.

ACF Appoints District Head

Harold M. Aitkenhead has been named district sales manager, St. Louis office, ACF Industries, Inc., New York. Mr. Aitkenhead came to ACF in 1936, and



CUSTOM-ENGINEERED
MINE CARS . . .



WHEEL AND CAR CORPORATION
BRISTOL, VIRGINIA - TENNESSEE
HUNTINGTON, WEST VIRGINIA



OSMOSE

TREATED

TIES AND TIMBERS

CAN SAVE YOU

25¢ per ton

Here's how! 30% to 50% of your supply bill is for TIMBER and TIMBER REPLACEMENT. Osmose scientifically-treated Mine Ties and Timbers can cut this expenditure to the bone simply because they LAST 3 to 5 TIMES LONGER. Mine ties and timbers don't just "rot" or "decay" in the sense that these two popular words might convey. Actually, they are "eaten up" by microscopic organisms that feed on the wood fibers. Osmose is poison to these micro-organisms, which die or look elsewhere for their food.

Proof of the fact that this 25c per ton saving is possible can be yours by directing an enquiry to any of a long list of famous mines that SAVE thousands of dollars per year with Osmose Treated Ties or Timbers. For instance, in 1954 the Island Creek Coal Co. said: "We have been using Osmose Timbers in our mines since 1942 . . . We are pleased with the results."

You'll be more than "well pleased" when Osmose Treated Ties or Timbers start saving YOU up to 25c per ton. Let us send you complete details NOW.

SEND FOR FREE BOOK

Colorful, completely illustrated booklet, gives you all the facts. Write for it.

OSMOSE WOOD PRESERVING COMPANY OF AMERICA, INC.
 980 ELLICOTT STREET • BUFFALO 9, NEW YORK

Representatives in: Pittsburgh, Denver, Birmingham, Ala., Charleston, W. Va. and Harlan, Ky.
 "Leading Manufacturers of Wood Treating Specialties"



COAL MEN ON THE JOB . . .

GUYAN EAGLE COAL, CO.: Walter Proctor, of Huntington, W. Va., consulting engineer for Guyan Eagle, underground in the Guyan No 1 mine, Amherstdale, W. Va.

formerly was sales agent in the St. Louis office.

Hamilton Rubber Div. Mgr.

Hamilton Rubber Mfg. Corp., Trenton, N. J., has appointed Andrew S. Kaminski Jr. division manager of its Chicago branch. Mr. Kaminski joined the Hamilton sales organization in 1947, serving in both office and field capacities.

Stearns Promotes Christnelly

Stearns Magnetic, Inc., Milwaukee, Wis., has announced the appointment of David F. Christnelly as assistant sales manager. Joining the company in 1951, Mr. Christnelly was formerly a member of the sales department and a production expeditor in the company's transmission plant.

Huber-Warco Consolidates

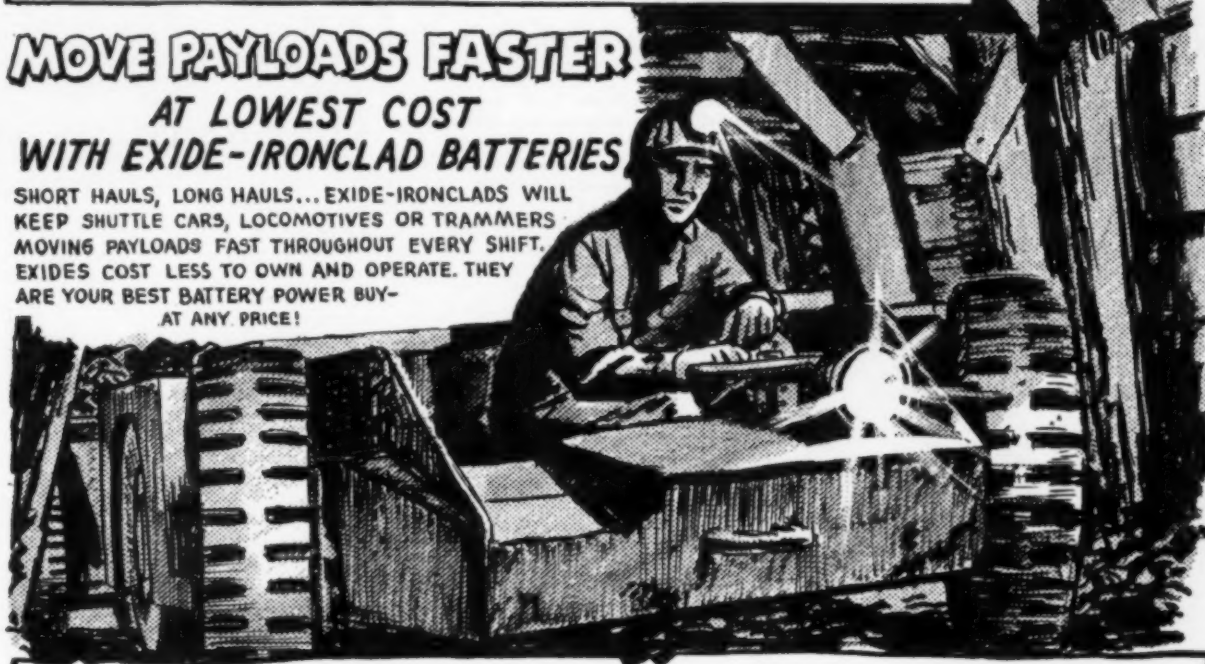
Directors and officers for the newly formed Huber-Warco Co. recently were announced, along with plans to consolidate general offices in Marion, Ohio, and continue manufacturing operations at plants in Marion and Bucyrus. The new firm is successor to the Huber Mfg. Co., Marion, Ohio, and the W. A. Riddell Corp., Bucyrus, Ohio, which used "Warco" as the trade name for its products. Clark T. McConnell, former president of Warco, was elected chairman of the board for Huber-Warco, and Don A. Howard, former Huber president, is president. Jacque E. Jones, of Bucyrus, Riddell vice president and general manager, was named executive vice president of Huber-Warco. Ralph Howard, formerly assistant to the president of Huber, was elected vice president. Established in 1863, Huber for many years has manufactured a complete line of rollers and other equipment for the maintenance of roadways and other areas. The 100-yr-old W. A. Riddell Corp. manufactures a full line of motor graders and grinding machinery used in the preparation of aggregates for special uses.

FACTS ABOUT Exide®

IRONCLAD® MINING BATTERIES

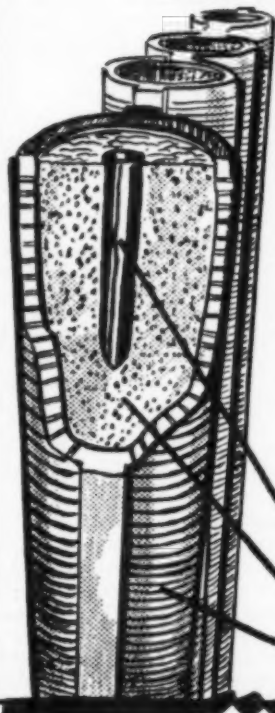
**MOVE PAYLOADS FASTER
AT LOWEST COST
WITH EXIDE-IRONCLAD BATTERIES**

SHORT HAULS, LONG HAULS... EXIDE-IRONCLADS WILL KEEP SHUTTLE CARS, LOCOMOTIVES OR TRAMMERS MOVING PAYLOADS FAST THROUGHOUT EVERY SHIFT. EXIDES COST LESS TO OWN AND OPERATE. THEY ARE YOUR BEST BATTERY POWER BUY-
AT ANY PRICE!



NATURE'S IDEAL SHAPE

THE **CIRCLE** WORKS FOR YOU
INSIDE AN EXIDE-IRONCLAD



SLOTTED TUBES INSIDE AN IRONCLAD KEEP ACTIVE MATERIAL IN FIRM CONTACT WITH CONDUCTING GRIDS OF THE POSITIVE PLATE... THIS GRID PROTECTION LENGTHENS LIFE OF BATTERY. THE SLOTTED TUBES EXPOSE MORE ACTIVE MATERIAL TO THE ELECTROLYTE... FOR GREATER POWER. FINE TUBE SLOTS HOLD MATERIAL IN CONTACT WITH GRID LONGER... RESULT, THE IRONCLAD'S ABILITY TO DO YOUR MINE HAULAGE JOB FOR A LONGER PERIOD OF TIME. THAT IS WHY

EXIDE-IRONCLADS
ARE YOUR BEST MINING BATTERY BUY-
AT ANY PRICE !



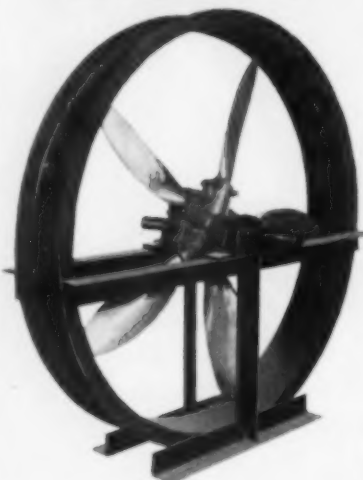
IRONCLAD POSITIVE PLATE

PROTECTED
CONDUCTING GRID
COMPRESSED
ACTIVE MATERIAL
SLOTTED
RETAINER TUBE

LET EXIDE HELP SOLVE YOUR MINING BATTERY PROBLEMS. ① CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ② WRITE FOR FORM 1982, A MANUAL ON MAINTAINING MOTIVE POWER BATTERIES.

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

GUYAN "Venta-Mine" FANS



The Ideal FAN
for economical
low pressure mine
ventilation.

Guyan Venta-Mine Fans are of sturdy, simple construction with a channel ring housing and electric welded angle cross members and vertical center angle supports.

These Fans are available in four sizes—36", 48", 60" and 72". Blades on all sizes are cast aluminum. The 60" and 72" diameter fans have hubs of high grade cast iron so arranged that blades may be pitched at different angles. The 36" and 48" diameter blades are cast solid and therefore are not adjustable. The shaft extends each side of fan so that driver may be installed on either side.

For complete construction details write for GUYAN catalog.

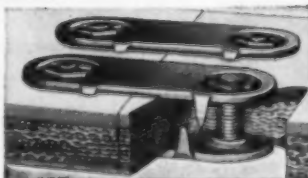
GUYAN MACHINERY CO. LOGAN, WEST VA.



BELT FASTENERS and RIP PLATES

FOR HEAVY
CONVEYOR
AND
ELEVATOR
BELTS OF
ANY WIDTH

- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute pull or tension uniformly.
- ★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.
- ★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.



Compression Grip distributes strain over whole plate area

Order From Your Supply House. Ask for Bulletin F-100

FLEXIBLE STEEL LACING CO., 4638 Lexington St., Chicago 44, Ill.



COAL MEN ON THE JOB . . .

BELL & ZOLLER COAL CO.: Nat Napier (left) and Jesse Bruce, section foremen, Orleole mine, Madisonville, Ky.

And For Your Information . . .

Duff-Norton Mfg. Co., Pittsburgh, Pa., has announced that John J. Dixon has succeeded Frank H. Schwerin as chief engineer. Mr. Dixon joined Duff-Norton in 1943 after serving in the engineering department of the Edwin L. Wiegand Co. Mr. Schwerin is retiring after 36 yr with the company.

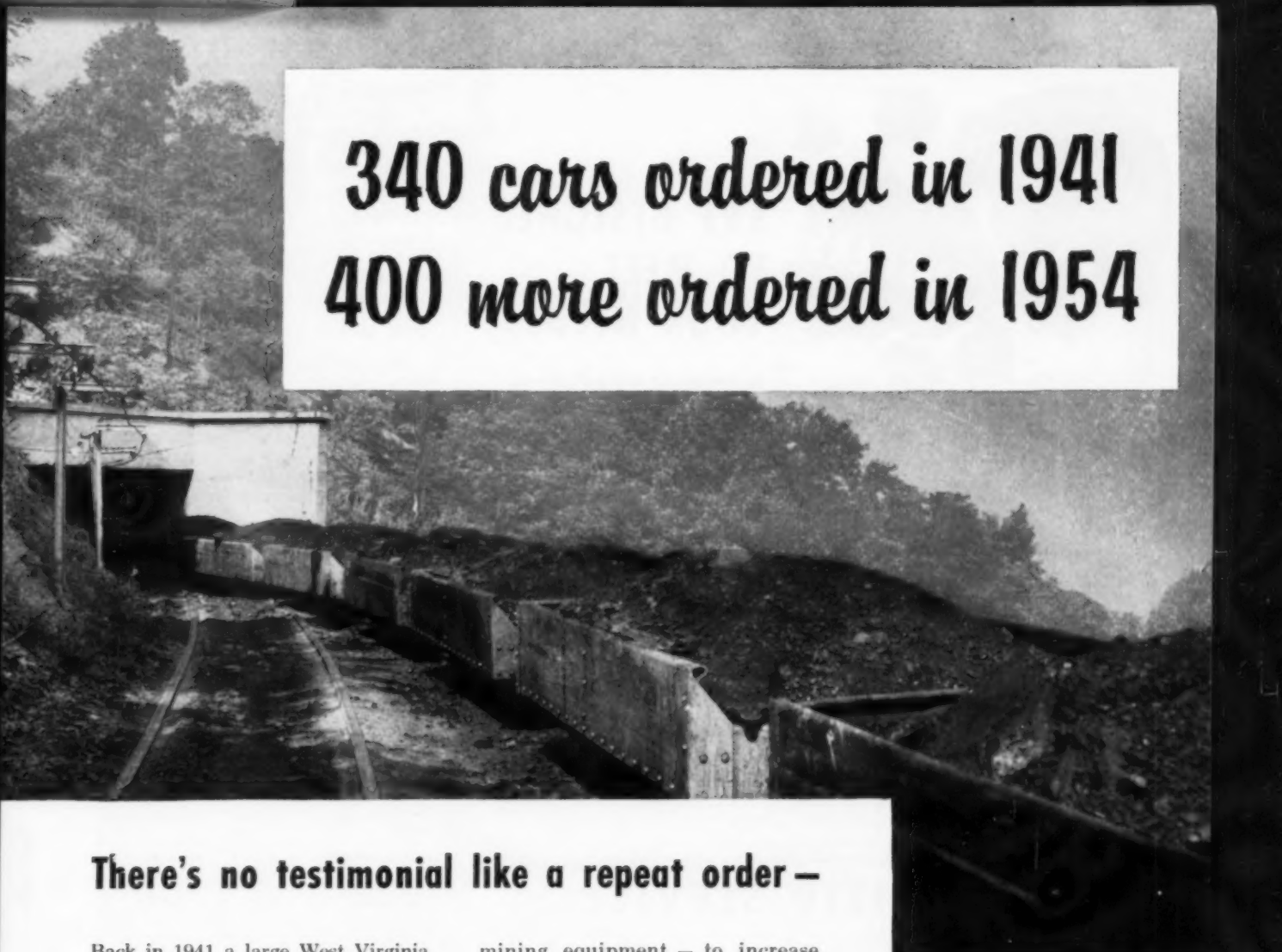
Four promotions involving veteran employees in the factory management of the Jeffrey Mfg. Co., Columbus, Ohio, have been announced as follows: Harold R. Warsmith, formerly superintendent of the manufacturing engineering division, named general superintendent of all productive divisions of the company; Charles S. Thomas, promoted to manager of the manufacturing engineering division; J. J. Kubbs, named chief metallurgist; and Archer B. Jones, made manager of the tool engineering department.

Chain Belt Co., Milwaukee, Wis., has promoted Bernard Schneider to chief engineer for the conveyor equipment section. Mr. Schneider has almost 30 yr of experience in conveyor engineering work.

The Detroit Diesel Engine Div., General Motors Corp., has appointed Charles H. Stewart factory sales representative to serve GM diesel distributors in the Dakotas, Minnesota, Nebraska, Iowa, Kansas and the western half of Missouri, succeeding William R. Bays, who is now the GM diesel distributor at Wichita, Kan. Mr. Stewart was formerly service representative for Detroit Diesel in a Texas zone and has been with the division since 1946.

General Cable Corp., New York, has announced that construction for its new press, which will be the first in the United States for the production of direct-extruded aluminum-sheathed cables, is expected to be completed this month. The new press, being built by Schloemann, of Dusseldorf, West Germany, will be delivered in mid-1955 and installed in the Perth Amboy, N. J., plant of General Cable Corp.

Construction Machinery Div., Clark



340 cars ordered in 1941
400 more ordered in 1954

There's no testimonial like a repeat order —

Back in 1941 a large West Virginia mining company bought 340 5-ton mine cars from A. C. F. Industries, Incorporated. These cars built with USS COR-TEN Steel have been in *continuous* operation for thirteen years, and are still in good operating condition. Because of this excellent service the mining company recently purchased 400 more . . . to be built with USS COR-TEN Steel.

Mining equipment gives extra long service when it is built with USS High Strength Steels—COR-TEN, MAN-TEN and TRU-TEN. That's because these famous steels have a 50% higher yield point, and offer greater resistance to wear, fatigue, abrasion and impact than carbon steel. Mine cars, draglines, 'dozers and buckets made with USS High Strength Steels can work hard and fast to boost production. They stay out of the repair shop, too.

You can use USS High Strength Steels in direct replacement of plain carbon steel in many parts of your

mining equipment — to increase strength and durability *without* increasing weight. Or, these tough, strong steels can be used in thinner sections: (1) to reduce equipment weight without reducing its strength; (2) to increase the size and capacity of equipment, without increasing the total weight or the power needed to move it.

And USS High Strength Steels have other special advantages. If your mining equipment must operate in sub-zero temperatures, must handle highly abrasive materials or work in unusually corrosive atmospheres you can build it with the USS High Strength Steel that offers high resistance to these destructive forces. The result—your equipment stays in productive operation and requires less maintenance and repairs.

For more information or application data concerning USS High Strength Steels call or write our nearest office.

SOON TO BE ISSUED

. . . our new "Design Manual for High Strength Steels" contains comprehensive and practical information that you will find extremely useful in designing your products for greater economy and efficiency by the sound use of high strength steels. Watch our future advertisements for the announcement of the availability of this important publication.

SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

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USS HIGH STRENGTH STEELS

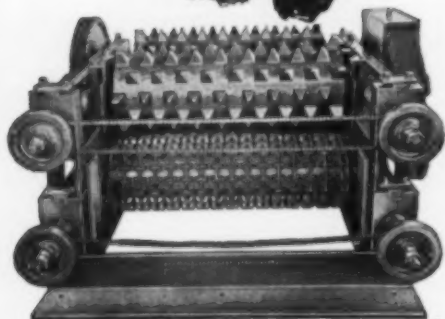


S-422

UNITED STATES STEEL



ARE DESIGNED TO MEET YOUR NEEDS



No matter what your coal crushing problem, there's a Gundlach crusher to do the job. Check this complete line of single and 2 stage crushers before you buy.

All Gundlach crushers are equipped with Gundlach Patented Crushing Rollers (Pat. No. 2578540) and are designed so that material size can be changed while the machine is running.

WRITE TODAY FOR A DEMONSTRATION AT YOUR MINE...

**T. J. GUNDLACH
MACHINE COMPANY**

226 CENTREVILLE • BELLEVILLE, ILL.

PERSONALIZED SERVICE...

your aid to increased

MINING efficiency!

Our Personalized Service in Workmen's Compensation and Public Liability can pave the way to greater mining economy and efficiency.

Call your C. O. C. C. representative today!

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- Lowered accident frequencies.
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- Prompt claims handling that promotes harmony.
- Effective rehabilitation of injured personnel.



THE SYMBOL OF SERVICE
FOR COMMERCE AND INDUSTRY

**COAL OPERATORS
CASUALTY COMPANY**
GREENSBURG, PA.

Equipment Co., Benton Harbor, Mich., has appointed Russell L. McKinley field service manager. Mr. McKinley was formerly service manager for Browning Crane & Shovel Co., Cleveland, where he had been employed since 1941.

E. J. Weller, carbide design and application engineer, Carboloy Dept., General Electric Co., Detroit, has been named manager of tool sales. He began his career with General Electric in 1937 with the Turbine Div., and joined the Carboloy Dept. early in 1954.

Diamond Power Specialty Corp., Lancaster, Ohio, has appointed Willis I. McCord manager of electronic sales. With the Allen B. DuMont Laboratories organization in various capacities for the past 10 yr, Mr. McCord will direct the sales for "Utiliscope" and "UtiliVue" closed-circuit industrial television systems.

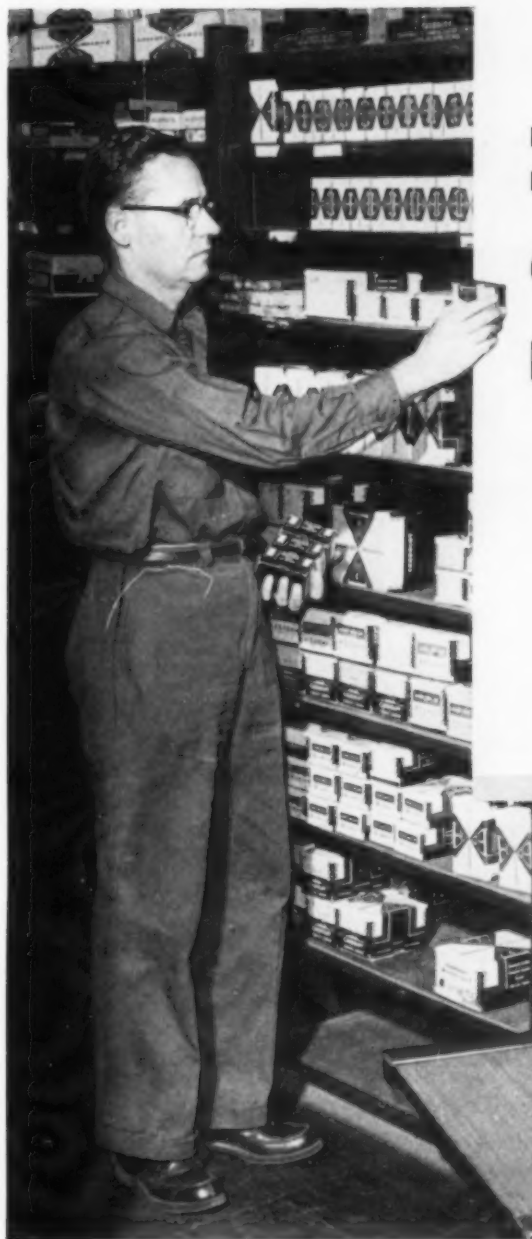
Baldwin-Lima-Hamilton Corp., Construction Equipment Div., Lima, Ohio, has appointed Kentucky Equipment Co., Inc., 3611 St. Germaine Court, Louisville, Ky., as distributor for Lima shovels, cranes, draglines and pull shovels for most of the state of Kentucky. The company also has appointed the Industrial Tractor & Equipment Co., Inc., Nashville, Tenn., as distributors for similar equipment in central Tennessee. The R. C. Larkin Co., Chicago, has been named to cover northern and central Illinois, handling the complete line of Baldwin-Lima-Hamilton construction equipment.

The Heil Co., Milwaukee, Wis., has advanced Harlan Stoller, former export and government sales manager, to the post of director of government, export and road machinery sales, responsible for the overall direction of the department. With The Heil Co. for 26 yr, Mr. Stoller was named manager of the newly-formed Heil export department in 1945. Paul Miller, with Heil for 17 yr and sales manager of the former road machinery division, has been appointed sales manager of the new department.

Leschen Wire Rope Div., H. K. Porter Co., Inc., has announced a new location for the Seattle warehouse and district sales office at 2724 First Avenue S. The new warehouse is served by a rail siding and has ample area to store and handle efficiently the varied stock of Hercules Red-Strand wire rope maintained.

Morse Chain Co., Detroit, Mich., has appointed the following new distributors to its nationwide U. S. distributor organization: Southern Bearings Service Co., 491 S. Second St., Memphis, Tenn., and 519 W. Seventh St., Little Rock, Ark.; and Neiman Bearings Co., 2837 Locust St., St. Louis 3, Mo., and 812 Illinois Ave., E. St. Louis, Ill.

Pittsburgh Screw & Bolt Corp., Pittsburgh, Pa., has appointed John Krause Jr. assistant to the general manager of sales. Mr. Krause had been associated for 27 yr with Oliver Iron & Steel Corp., most recently as assistant general manager of sales.



Let your Authorized Carboly
Distributor carry your . . .

Quickly Available Mining-Tool Stock

Complete stocks of full mining-tool
line cut your at-mine cost, reduce
inventory overhead, save space.



If you are now using carbide mining tools — take advantage of this local service. Purchase mine-improved carbide tools from complete stocks ready to fill your orders instantly.

If you have not changed to carbide mining tools — investigate the cost savings possible by changing from steel to carbide tools. Carboly® carbide mining tools

consistently outlast steel tools up to 50 times. They increase tonnage per shift by cutting more coal in less time, more freely, and with decreased power consumption. Tonnage goes up 20-30 percent per shift.

Ask your distributor for experienced assistance from Carboly salesmen, who will work in your mine on carbide mining-tool applications.

"Carboly" is the trademark for products of the Carboly Department of General Electric Company

CARBOLY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

11120 E. 8 Mile Street, Detroit 32, Michigan

Carboly Created-Metals for Industrial Progress



DART CUTS COSTS



At Sunnyhill, as in many other modern operations, DART TRUCKS have reduced haulage costs and helped to increase production. 10 DART 50-S-BDT Trailer Trucks are making performance records at Sunnyhill.

WHAT IS YOUR HAULAGE PROBLEM?

...close quarters in the pit? Sharp turns? Steep grades? DART engineers may have the answer for your specific problem!

For over 50 years, the DART TRUCK COMPANY has specialized in the building of heavy duty, off-highway trucks—you will find DART TRUCKS in pits and mines all over the world "delivering the goods" with dependability and low maintenance costs.

Shortly after World War II, these DARTS went into service at the Crowe Coal Company, Clinton, Mo. Operating almost daily, the fleet of 7 DARTS at Crowe provide low cost, dependable haulage.



FEATURES OF THE DART 50-S-BDT

60 cubic yard bottom dump coal hauler. 300 H. P. Diesel Engine, Allison converter and 3 speed transmission, or optional Twin Disc converter and 4 speed transmission. Trailer axle, 85,000# capacity, 20 x 9" air brakes, air dump. Approximate weight, 68,000#.

DART TRUCKS
Kansas City 8, Missouri
SUBSIDIARY OF THE CARLISLE CORPORATION

D102



IMPOSSIBLE WITHOUT EXPLOSIVES

Stripping operations accounted for nearly one quarter of the total production of coal last year. This photo illustrates a deposit five feet thick which could be reached only by blasting and removing 75 feet of over-burden. This is the kind of job that never could be handled economically without explosives. Hercules has pioneered in developing the right types of explosives and has the service facilities to help you to solve blasting problems concerning coal mining, metal mining, quarrying, construction, or petroleum.

HERCULES POWDER COMPANY

Explosives Department, 936 Market St., Wilmington 99, Del

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Cal.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Cal.





NEW **SCANDURA** the original P.V.C. coated CONVEYOR **BELTING**



*Top photo shows Face Conveyor in British coal mine. Inset shows roll of SCANDURA.

eliminates big **FIRE HAZARD** in mining operations

One of the great hazards of mining—fire caused by a belt stalled over a still-rotating driving drum—is eliminated by new SCANDURA BELTING . . .

the original P.V.C. Coated Conveyor belt which was developed in the United Kingdom and now manufactured by us in our Charlotte, N. C. plant.

LET'S LOOK AT THE RECORD!

About 12% of coal mining fires in the past several years have been attributed to conveyor-belt friction.

At the 1953 annual meeting of the Illinois Mining Institute, data was presented to show that the majority of belt fires result from stalled belts while the driving pulley continues pulling.

In the tragic Evanston, Ky. fire in which 4 men lost their lives, fire was reported to have had its origin in the friction caused when a fall stopped the belt, while the drive motor continued to operate.

This record clearly points to the great need for SCANDURA BELTING!

Other unique SCANDURA features:

- Withstands abrasions that would ruin other belts.
- Exceptionally tenacious in holding fasteners.
- Solid woven base with covers that will not strip, gouge or "dog ear".
- Not affected by water, dilute acids, alkalis, salt solutions, etc.
- Non-inflammable, mildew and rot-proof.
- Works in temperatures ranging from 22° below to 212° above.
- Can be made in widths from 1" to 42" and thicknesses from 1/8" to 3/4".



SCANDURA has been tested and used with gratifying results in Britain since 1946. For safety and economy, it's in a class by itself. Write, wire or telephone for complete data.

SCANDINAVIA BELTING COMPANY
250 CENTRAL AVENUE, NEWARK 1, N. J.
BOSTON • PLANT: CHARLOTTE 1, N. C. • CLEVELAND



FOR MEN WITH AN EYE ON THE FUTURE

MARION 191-M ¹⁰cu.yds.

THE WORLD'S LARGEST LOADING SHOVEL

Men of vision in many industries thrill to the potentials of this machine, the world's biggest shovel on two crawlers. New in this decade, the MARION 191-M pushes aside mechanical limitations of the past and gets BIGGER jobs done BETTER as well as FASTER.

It has the cycle time, maneuverability and travel speed of

small machines, and is the ideal working companion of the world's largest haulage units.

The skill and experience that developed the 191-M are qualities that make MARION-OSGOOD-GENERAL the preferred excavating machines in all sizes from ½ to 60 cubic yards.



MARION • OSGOOD • GENERAL

MARION POWER SHOVEL CO. • MARION, OHIO, U. S. A.

A Subsidiary of Merritt-Chapman & Scott Corporation



POWER SHOVELS FROM ½ TO 60 CUBIC YARDS
PILE DRIVERS • WALKING DRAGLINES



DRAGLINES • CLAMSHELLS • CRANES • BACKHOES
TRUCK CRANES • MOBILCRANES • LOG LOADERS

Your Confidence Is Justified Where This Flag Flies



NUSSCO AUTOMATIC BLOCK SIGNALS FOR MINES

Save Trip Time on Main Haulage
Prevent Collisions

A two wire cable connects two or more signals together into one block. Only one signal can show proceed on the entrance of a trip, all other signals show stop.

- Low in Cost.
- Easy to Install.
- Write for Catalog.

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INCORPORATED

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"Cheatham Switch" TRACK POINT SHIFTER ELECTRICALLY OPERATED

Thrown by Motorman • Saves Time and Money

This modern track switch is thrown swiftly and safely by motorman as they sit in their cabs. It saves time and money, and is fool-proof and dependable!

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Write for Catalog

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COAL AGE, 330 West 42nd Street
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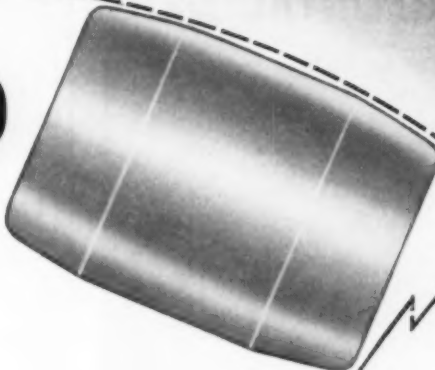
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NOW...all **Tru-Rol** Bearings

have

CROWNED ROLLERS

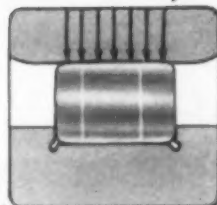


● When a straight cylindrical roller bearing is under load, the highest stresses tend to concentrate at the roller ends. Stresses may become excessive and cause early bearing failure.

Crowning is a Rollway grinding refinement that adds a long radius curve to the roller ends. This relieves the high stress areas—allows the rollers to take heavier loads and reduces the effect of slight shaft misalignment or deflection. Bearings can be load rated at substantially higher values—provide a longer service life.

Crowning is but one of the many engineering advances built into Rollway Tru-Rol Bearings. Write for the complete story. Rollway Bearing Co., Inc., Syracuse, N.Y.

Carefully selected crown radius, varying from 20" to 260", provides proper relief for normal loading to which bearing will be subjected.



Crowned roller under full load
—stress uniformly distributed.

Crowned Tru-Rol Bearings available in the following type:



Full Roller

Segmented Steel Retainer



Stamped Steel Retainer with Guide Lips



New Rollway Tru-Rol Catalog features RBEC formula converted to simple nomogram. Send for your copy today.



SALES OFFICES: Syracuse • Chicago • Toronto • Cleveland • Seattle • Philadelphia • San Francisco • Boston • Detroit • Pittsburgh • Milwaukee • Houston • Los Angeles

Parmanco

H-81-53
HORIZONTAL DRILL



*Easily cuts drilling time
IN HALF*

Completely Re-designed

- with hydraulic feed
- horse power increased to 81 with "254" cubic inch engine

Included in the new design is a sturdier frame, with the elimination of racks, pinions, and all mechanical power feed gearing. The four individually adjustable jacks make possible faster set-up and smoother drilling.



The H-81-53 drill is designed for drilling 5-6-8 inch holes to 100 feet or more. The greatly increased 81 h.p. engine in combination with the hydraulic feed makes possible the reduction of footage time by at least one half. All drive gears are totally enclosed. Power feed features direct hydraulic feed eliminating reduction gearing in hydraulic feed system.

This new drill—the very latest in design—is equipped with self-starter and generator, dual type front wheels, truck type rear axle with hydraulic brakes, and traction drive with both forward and reverse. Here is greater speed in retrieving augers and four rotating speeds and reverse for drilling and cleaning the hole. Here is accuracy and mobility. Here is the modern answer to faster, lower-cost drilling. Send for complete details.

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Here, in a single organization, you have the experience, the knowledge and the facilities you can employ with complete assurance . . . and a long list of satisfied customers. We welcome your inquiries; and consultation, of course, does not obligate you in any manner.

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REPLIES (Box No.): Address to office nearest you
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CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)**POSITION VACANT**

WANTED SAFETY Supervisor—mining and manufacturing experience preferred. General safety supervision national multiplant operation. Outline experience and qualifications. Address reply to P-5133, Coal Age.

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NEW & REBUILT electric equipment catalog #54, 32 pgs with illustrations. Write Electric Equipment Co., P. O. Box 51, Rochester 1, N. Y.

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3 year seedlings.

For spoil bank and reforestation plantings. Have large supply. Low price on 100,000 or more orders. Write:

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FORD,

6425 Hollywood Bl., Los Angeles 28, Cal.

Marion 7200 diesel walking dragline; new 1948, 135' boom and 5 cu. yd. bucket; working at Coalgate, Oklahoma, available now. Contact Henry L. May c/o

C. Y. Sample

P.O. Box 390, Baxter Springs, Kansas
phone 44 Picher, Oklahoma.**At Your Service . . .**

The Searchlight Section is at your service to bring business needs or "opportunities" to the attention of men in executive, management, sales and responsible technical, engineering and operating capacities with the industry served by this publication.

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- 1—24"x24" Jeffrey single roll
1—24"x35" McNally-Pittsburg double roll

TUGGER & SLUSHER HOISTS

- 1—7½ HP Sullivan double drum electric
1—10 HP Sullivan 3 drum
1—Ingersoll-Rand 6HC air tugger
1—Ingersoll-Rand D6U air tugger
2—6½ HP Sullivan tuggers, 250V. D.C. single drum
2—6½ HP Sullivan 2 drum, 250V. D.C.
1—10 HP Sullivan 2 drum, gas engine driven

BOX CAR LOADERS

- 3—Ottumwa 20 HP box car loaders
2—Manierre 22 HP box car loaders
1—Jeffrey 20 HP box car loader
2—Red Devil portable loaders, 12"x15"
1—Card portable loader, 11"x19"

SCRAPER CONVEYORS

- 1—Link Belt, 50' centers, 12' flights
1—Jeffrey, 75' centers, 9' flights
1—Jeffrey, 67' centers, 30' flights
1—Jeffrey, 72' centers, 30' flights
1—Jeffrey, 88' centers, 30' flights
1—Jeffrey drag, 28' centers, 9' drags
1—Jeffrey drag, 28' centers, 30' drags

ROTARY DUMPER

- 1—Card Rotary car dumper, 13"x15" platform

ELECTRIC HOISTS

- 1—11 HP Vulcan, single drum
1—20 HP Vulcan, single drum
1—22 HP Vulcan, double drum
1—25 HP Vulcan single drum
1—30 HP Vulcan, single drum
1—37 HP single drum
1—50 HP single drum
1—60 HP single drum
1—100 HP Box single drum
1—112 HP Vulcan, single drum
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We have in stock good relaying rail 16" to 100", also new rail and fittings, 12", 16" and 20".

LOADERS & CONVEYORS

- 2—1BU Joy loaders, 250V. D.C.
2—7 BU Joy loaders, 250V. D.C.
3—5 BU Joy loaders, 250V. D.C.
1—6IEW Jeffrey sloping chain conveyor
1—6IHG Jeffrey chain conveyor, 90'
1—6IWF Jeffrey chain conveyor, 200'
9—G-20 Goodman shakers
6—G-15 Goodman shakers
6—Vulcan shakers

- 2—UN-17 Joy LaDel shakers
10—Goodman HA duckbills

MINING MACHINES

- 1—7B Sullivan super shortwall
16—Sullivan C&Z
1—CR3 Sullivan
6—112A Goodman

D.C.

- 4—7B Sullivan super shortwall
2—T-1 Sullivan crawler type trucks
7—12AB Goodman
1—CH-11 Sullivan ironclad
1—29C Jeffrey arcwall

SCALES

- 3—100 ton Fairbanks railroad scales
1—125 ton Howe railroad scale

SCREENS

- 1—41"x68" Jeffrey-Traylor electric
1—48"x78" Jeffrey-Traylor electric
1—3'x8" Simplicity 3 deck
1—3'x12" Symons single deck
1—4'x12" Symons double deck
1—4'x12" Tyler Ty-rock 3 deck
1—2 deck shaking screen, 18"x86"
1—32"x84" 4 deck shaking screen

COAL CARS

- 89—60 cu. ft. Card steel, end dump, 36" ga.
88—60 cu. ft. Card steel, end dump, 36" ga.
48—150 cu. ft. Watt steel, end dump, 42" ga.
100—107 cu. ft. Watt steel, end dump, 42" ga.

SHUTTLE CARS

- 1—Joy model 42DS, battery operated
4—Joy model 60D3P, battery operated
7—Joy model 60D1, battery operated

LOADING POINTS

- 4—Joy type P11-3E, 10 HP, 250V. D.C.

CAGES AND HEAD SHEAVES

- 2—Card automatic self-dumping cages
2—108" Card bicycle sheave wheels
2—96" wood filled sheaves
2—94" Card bicycle sheave wheels
3—72" bicycle sheave wheels

MINE FANS AND BLOWERS

- 1—108" Joy La-Del axial flow fan, model L-14
1—8M Jeffrey 42" aerodyne fan
1—7" Jeffrey aerodyne 2 stage fan
6—Joy axivane series 1000 blowers, 5 HP
1—Jeffrey 261 blower, 1½ HP
7—Jeffrey aerodyne midjet blowers, 1½ HP
1—2600cfm Brown-Fayre blower, 1½ HP

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Serving Coal Industry GOOD EQUIPMENT PRICED RIGHT IN OUR STOCK

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- 2—32ES Shuttlears
1—12 BUSE Leader
2—8BU Leader
1—20" Chain Conveyor

MACHINES AND PARTS

- 512 CJ Goodman, Rebuilt
212 AA Motor, Rebuilt
512 CJ Motor
512 CJ Main Frame
11B Sullivan

CUTTER BARS AND CHAINS

All Makes

SUBSTATION

- 200 KW Westinghouse—R.C.
14—S-D 48" G. 18" High.

ROCKDUSTERS

- 2—American Mine Door, "Distributors".
"Eagle" 12" x 16"—Stoker Size.

BALL BEARING MOTORS

T.E.F.C.—3/60/220-440 volt

H.P.	RPM	Frame
2	1200	225
2	1800	225
3	1000	225
5	1200	284
5	1800	254
7½	1200	324
7½	1800	284
10	1200	326
10	1800	324
15	1200	363
15	1800	326
25	1800	365
40	1800	405

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CAT TRACKS

- 1—Goodman Type RHT-2 Cat Truck, 250 volts DC, like new.
1—Joy T-2 Cat Truck, 250 volts DC.
1—Joy T-1 Cat Trucks, 250 volts DC.
1—Goodman MAT Cat Truck, 250 volts DC.

CONVEYORS

- 1—30" Joy belt conveyor, 850' centers. Unit used less than six months, absolutely perfect condition.

COPPER

- Several thousand feet of 1,000,000 CM weatherproof in lengths 300' to 500' wrapped on reels.
Approximately 30,000' 1,000,000 CM Bare, wrapped on reels, lengths 500' to 1000'. Just as good as new.
Approximately 5,000' 500,000 CM bare, wrapped on reels, lengths 500' to 1000'. Like new.
Several thousand feet 6/0 Fig. 8 Trolley wire, long lengths.
Several thousand feet 4/0 Fig. 8 Trolley wire, wrapped on reels and coils. Like new.
Several thousand feet 2/0, 3/cond, armored steel, lead covered, 2300 volts to 5000 volts.
Several thousand feet 2/0 to 3/cond, Trenchlay, 2300 volts, like new, in lengths 500' to 1000'.
Several lengths from 300' to 400' each 4/0, 3/cond, rubber covered, armored drill hole cable. Perfect condition.

CRUSHERS

- 2—36 x 36 Jeffrey Single Roll in perfect condition.
1—24 x 48 McNally-Pittsburg Double Roll.
1—24 x 24 Jeffrey Single Roll.
1—24 x 24 McNally-Pittsburg Single Roll.
1—24 x 24 Webster Single Roll in perfect condition.
1—24 x 20 Jeffrey Flextooth.

FANS

- 1—30" Jeffrey 8H-30 Aerodyne Fan, like new.
3—6" Jeffrey Aerodyne fans, new in 1948.

DRILLS

- 2—580 Chicago Pneumatic DC Drills with TDA659 arms, mounted on Cat Truck. In perfect condition.

LOADING MACHINES

- 5—11BU Joy Loaders, type 10APE, 250 volts, DC Permissible.
2—8BU Joy Loaders, 220 volts, AC.
2—8BU Joy Loaders, 250 volts, DC.

LOCOMOTIVES

- 8—15-ton Jeffrey, type MH77, ball bearing motors, air brakes, 42" gauge, new in 1946, new type resistance, locomotives are as good as new. Overall dimensions: length 14'7", width 5'2", height from rail 40", outside armor steel frame 3½". Can be made 36" gauge.
5—15 ton Goodman, type 36-A-94C, 42" gauge, ball bearing motors, overall dimensions: length 14'7", width 5'2", height from rail 40", outside armor steel frame.

- 1—3600cfm Claridge blower, 3 HP

PICKING TABLES

- 1—20"x18" Link-Belt
1—41"x30" Card
1—51"x48" Card
1—73"x30"
1—64"x48"

LOCOMOTIVES

Battery operated

- 1—2 ton Whitcomb, 24" ga.
2—2½-3½ ton Mancha, 24" ga.
1—4 ton Westinghouse, 24" ga.
1—4 ton Ironton, 36" ga.
2—3 ton General Electric, 36" ga.
2—7 ton General Electric, 36" ga.
3—8 ton Ironton, 36" ga.
2—8 ton General Electric, 36" ga.
2—8 ton Goodman, 36" ga.
4—10 ton Atlas, 36" ga.

TROLLEY LOCOMOTIVES

- 1—2½ T. Jeffrey, 36" ga.
1—4½ T. Goodman, 36" ga.
1—3 T. Jeffrey, 36" ga.
1—6 T. Goodman, 36" ga.
1—6 T. Goodman, 42" ga.
2—8 T. Goodman, 42" ga.

BATTERY CHARGERS

- 1—8.2 KW G. E. 150/182 V., 15 HP motor, 440V. AC
1—8.5 KW Hertner, 183/120V., 15 HP motor, 440V. AC
1—10 KW Hertner, 150/181V., 15 HP motor, 440V. AC
1—11.5 KW West., 123 V., 17.5 HP, 440 V AC motor
1—15 KW Elec. Prod. 132 V., 30 HP motor, 440 V AC
1—30 KW Hertner, 155 V., 75 HP motor, 440 V. AC
4—250V D.C. battery charging switchboards
1—Joy battery charger, model U-240-20GE 125.5 volts
25 HP motor, 440 volts AC
1—Joy battery charger, model U-240-20GE 126.5 volts
30 HP motor, 250 volts DC
2—Joy battery chargers, model U-248-BE3 123.5 volts,
15 HP motors, 250 volts DC
3—Wotton type P-48, 132 V., 30 HP motors, 250 V. DC

MOTOR-GENERATOR SETS

- 1—7 KW G. E., 125 V., 15 HP motor, 440 V. AC
1—7½ KW Century, 150 V., 15 HP motor, 440 V. AC
1—22 KW West., 125 V., 34 HP motor, 440 V. AC
1—40 KW Milwaukee 240 V., 50 HP motor, 440 V. AC
1—40 KW Imperial 250 V., 60 HP motor, 440 V. AC
1—3 P W Ft. Wayne 250 V., 100 HP motor, 440 V. AC
1—75 KW Ridgway 125 V., 115 HP motor, 2200 V. AC
1—165 KW G. E. 600 V., 300 HP syn. motor, 440V. AC

ROCK DUSTERS

- 1—M.S.A. type A, 2 HP 250V. DC motor
1—M.S.A. type A, 440 V. AC motor
1—M.S.A. 2S-1103, 20 HP 230 V. DC motor

- 2—15 ton Jeffrey, type MH 74, ball bearing motors, 42" gauge, outside armor steel frame, overall dimensions: length 14'7", width 5'2", height from rail 40".

- 1—10 ton Jeffrey, type MH 143, ball bearing motors, ball bearing journals, 42" gauge, late type.

- 50—6 ton Jeffrey MH 88, ball bearing motors, complete with gathering reels and new type steel resistance, 42" gauge, overall dimensions: length 13' width 48", height from rail 29". Locomotives in perfect condition, ready to go to work without spending a cent on them.

- 25—5½ ton Mancha battery locomotive, complete with practically new Gould and Exide batteries, 48 cells with 27 and 29 plates. Batteries have been fully charged, and some used less than 6 months. Overall dimensions: length 12', width 60", height from rail 42", height of battery box only 29". We can make a special price for either the complete locomotive with the batteries, or the batteries alone.

Also many 5 to 12 ton Jeffrey and Goodman locomotives in gauges from 36" to 48".

MINING MACHINES

- 4—512 ESH Goodman, 250 volts, DC, 8½" cutter bars with hydraulic jacks and bug dusters, complete with Joy T1 Cat Trucks, Permissible.
3—512DJA Goodman, 220/440 volts, AC, 8½" cutter bars, with Joy T1 Cat Trucks.
6—7B-1 Sullivan, 250 volts, DC, 8½" cutter bars, complete with bug dusters, permissible, with Joy T1 Cat Trucks, permissible.

MOTOR GENERATOR SETS

- 1—300 KW Ridgway, 2200 volts, 250 or 275 volts, DC, 1200 RPM, complete with switchboard.
2—380 KW General Electric, 2300 volts, AC, 275 volts, DC, 1200 RPM, complete with fully automatic switchboard.
1—200 KW Westinghouse, 2200 volts, AC, 275 volts, DC, 900 RPM with automatic circuit breaker for DC and manual starter for AC.
5—150 KW Westinghouse, 2200 volts, AC, 275 volts, DC, 1200 RPM, complete with fully automatic switchboard.
1—150 KW General Electric, 2300 volts, AC, 275 volts, DC, 1200 RPM, complete with fully automatic switchboard.

MISCELLANEOUS

- 150—7 ton ACF all steel drop bottom mine cars, 14' wide, 48" high, 48" gauge, 16" wheel, like new.
12—42D Joy battery shuttle cars, excellent condition, cheap.
2—MSA rock dusters, type 8 track mounted, 42" ga.
5—4' x 10' Selectro single and three deck vibrators.
2—6' x 14' Robbins Gyrex two deck vibrators.

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OFFERING AT UNHEARD OF LOW PRICES

- 10—55C7AE and 7CXE Shuttle Cars, matched pairs, elevated discharge, all hydraulic
 2—6SC5E Shuttle Cars
 10—42E Shuttle Cars, all hydraulic
 12—14BU-3PE Joy Loading Machines
 7—11BU10 Joy Loading Machines
 3—11BU12 Joy Loading Machines

All types of Cutting Machines—cat, track, and rubber tired.

- 5—G.E. 200 KW late type M.G. Sets, 1200 RPM, 275 V DC, 2300/4000 V AC, with

- 1600 amp. I-T-E automatic reclosing circuit breakers, full automatic switchgear.
 2—G.E. 150 KW M.G. Sets, 1200 RPM, 250/275 V DC, 2300 V AC. Complete units.
 3—G.E. 200 KW Rotary Converters, type HCC-6, Form P, 1200, 250/275 V DC, 2300/4000 V AC transformers. Complete units.
 300—Practically new Sanford-Day 42" gauge Rotary Dump Mine Cars, all steel.
 200—Practically new 6-ton Sanford-Day Drop Bottom Mine Cars, 48" gauge, almost new.

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- 2—15-ton Jeffrey MH-77 Locomotives, Ser. Nos. 7304-7790.

- 1—20-ton Jeffrey MH-77 Locomotive, Ser. No. 7615.

The above are 42" gauge but can be changed to 44" or 48". All are completely rebuilt and

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Several late type 4-, 5-, and 6-track Steel Triples, Link-Belt and McHally-Pittsburg 5-cell Coal Washers, and two Link-Belt Multi-Louvre Dryers, single and double drum Hoists for shaft, slope, and drift mines, with 300 to 1200 HP motors.

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600	Penns.	2400	240/480	1
500	G.E.	22000	2300/4000	3
400	G.E.	2300	230/460	3
200	G.E.	22000	2300/4000	3
200	Pgh.	22000	220/440	3
125	West.	11000	2300	3
100	West.	13200	2300	3
65	G.E.	2300/4000	206/103	3
50	Pgh.	6600	2200	3
15	G.E.	2300	120/240	3
5	G.E.	2300	115/230	3

3 phase unit.

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- 400 KW West. 550 v. 720R-Syn.-SK 2300/4000 v.
 300 KW West. 275 v. 1200 R-Syn. 2300 v.
 300 KW G.E. 275 v. 1200 MPC-AT1 2300/4000 v.
 Full automatic.
 200 KW G.E. 275 v. 1200-MPC-AT1 2300/4000 v.
 200 KW Ridg. 275 v. 900R-Syn. 2300 v.
 150 KW G.E. 275 v. 1200 R MFC-AT1 2300/4000 v.
 100 KW Ridg. 275 v. 1200R-Syn. 2300 v.
 75 KW West. 250 v. 900 RPM.—Syn. 220/440 v.

ROTARY CONVERTERS

- 2—500 KW G.E. 275 v. HCC6-1200R. 13,200 v.
 300 KW G.E. 275 v. HCC6-1200R. 2300/4000 v.
 300 KW West. 275 v. 1200 R. 2300/4000 v.

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 One 300 H. P., A. C., 2200 volts, 3 phase, 60 cycle, 585 RPM.

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24"	5.23/ft.	3.76/ft.
30"	6.39/ft.	4.60/ft.

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25% Below List Price

3-roll, 5" diameter Troughing Idlers for			
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- 2-14BU, 3 PE med. pedestal Loaders, 7 1/2 H.P. Motors.
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- 1-112AA Universal
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- 3-61 HG Face Conveyors, 50 ft. ea., permissible
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- 1-T2-3 Joy Cat Truck
- 1-Goodman Low Pan Cat Truck
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- 1-112 AA Universal Low Vein Truck } Any Gauge
- 5-35B Trucks, quarter & tip turn
- 10-12AA Standard Goodman Trucks
- 100-End Dump, 42" t.g. mine cars (American Car & Foundry)
- 250-End Dump, 44" t.g. mine cars (Wood)
- 75-Sanford Day, drop bottom, 48" t.g. Mine Cars (Like New)
- 5-HKL Brown Fayette Car Spotting Hoist
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- 100-tons 40 lb. ASCE Steel rail.
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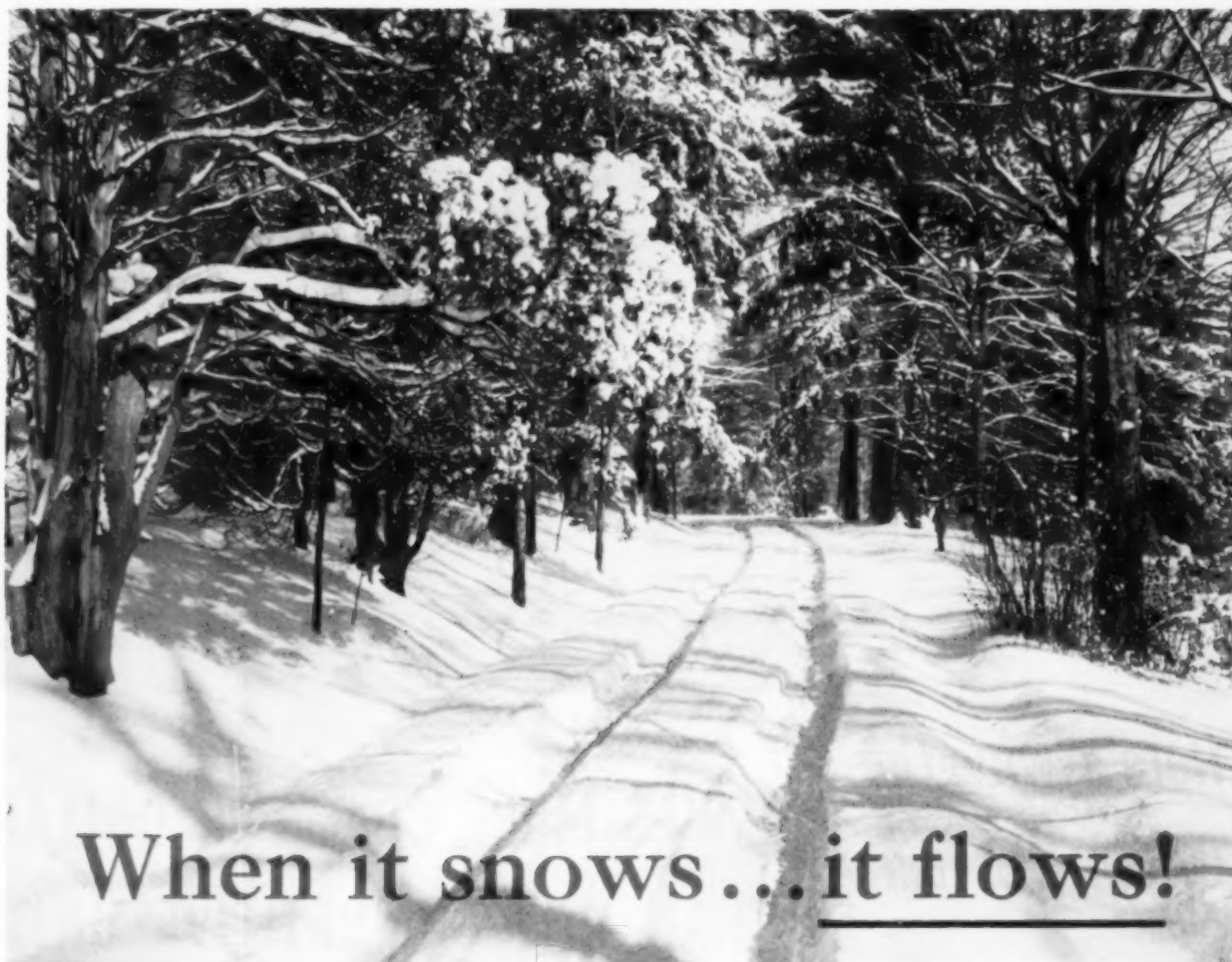
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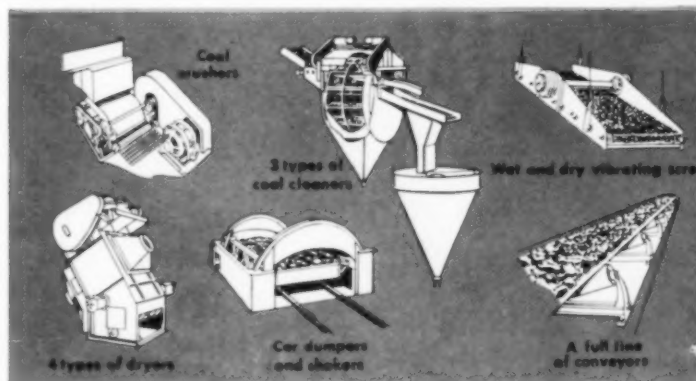
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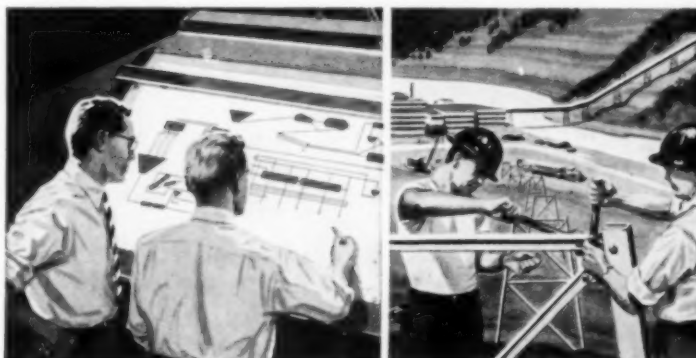
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